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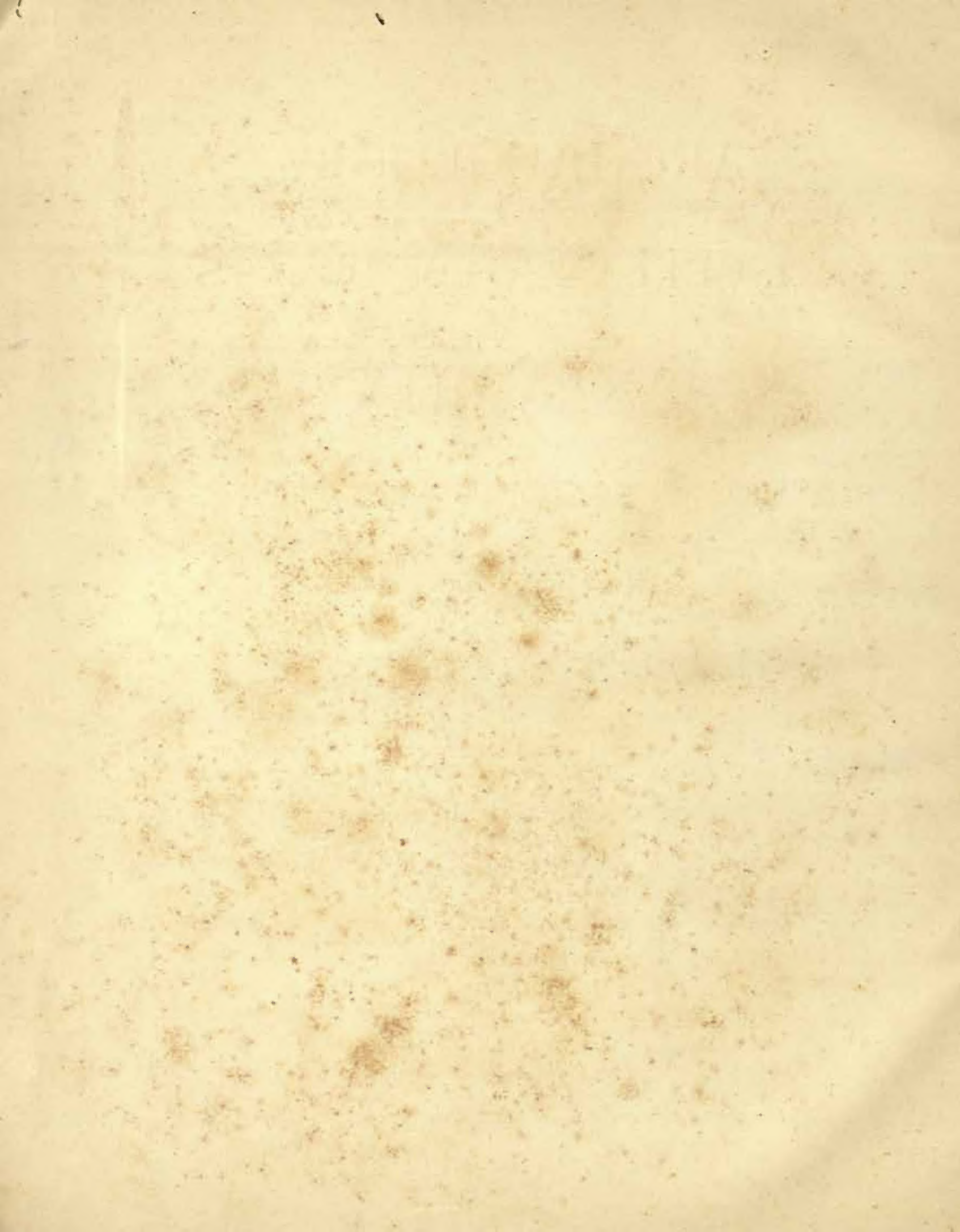
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RELATING TO
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PUBLISHED BY THE
SOCIETY OF ANTIQUARIES OF LONDON
VOLUME LXII

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SECOND SERIES: VOLUME XII



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MCMXI





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'THOS. JOHNSON FECIT. CANTERBURY QUIRE AS IN 1657. YE PROSPECTE FROM YE CLOCK HOUSE'

Published by the Society of Antiquaries of London, 1911

XV.—*Canterbury Cathedral Choir during the Commonwealth and after, with special reference to two oil paintings.* By W. D. CARÖE, Esq., M.A., F.S.A.

Read 1st December, 1910.

I AM not quite sure how far the later records of Canterbury Cathedral are of sufficient importance to interest this Society, but, as we have long learnt that neither archaeology nor traditional architecture stop short in the middle of the sixteenth century, I exhibit two oil paintings of the interior of the choir of Canterbury Cathedral as in the latter half of the seventeenth century, and offer some notes upon them. A study of later documents, chiefly relating to destructions or replacements, certainly helps to throw light upon earlier history.

No. 1. In oil, on canvas; size, 3 ft. 5 in. by 2 ft. Inscribed upon the pavement:

Thos. Johnson fecit. Canterbury Quire as in 1657.

Y^e prospecte from y^e Clock House.

Picture in my possession.

No. 2. In oil, on canvas; size, 4 ft. 0 $\frac{3}{4}$ in. by 3 ft. 2 $\frac{3}{4}$ in. No inscription or signature. Point of view about the same as no. 1, but a little more elevated. Picture in possession of the Rev. A. J. Mason, D.D., Canon Residentiary of Canterbury and Master of Pembroke College, Cambridge, by whose kindness I am able to make the exhibit.

NO. 1. (PLATE XL.)

I bought the picture from a Mr. Haines, of Norbiton, who could give no information about it save that it had belonged to his father, just deceased. It was clouded with dirt and a dark-brown varnish to such an extent that no detail was visible unless the surface were wetted, but *per contra* it was highly recommended to me as enclosed in a fine gold frame, which I spare the Society. The removal of this frame and the varnish and dirt displayed the picture as you now see it. I can find little or nothing about the painter. In the original edition of Dugdale's *Monasticon*, published in 1655, five of the illustrations of Canterbury are drawn by

Johnson, two being engraved by Wenceslaus Hollar, and three by Daniel King. These include the plan, which was repeated with slight changes in Dart's *Canterbury* and elsewhere. This plan is frequently referred to by Professor Willis as Hollar's plan, when it ought to be called Johnson's. If we judge by the drawing I now exhibit it is abundantly clear that Johnson was a better draughtsman than Hollar or King were engravers. Dugdale's illustrations bear no relation either as regards skill or accuracy to the work before us.

Johnson appears in the Print Room Catalogue at the British Museum thus: 'T. Johnson. Worked about 1675,' and the nation has an interesting wash and pen drawing by him, signed and dated 1675, depicting the King's and Queen's Baths at Bath.

In Mr. Laurence Binyon's *Catalogue of Drawings by British Artists* he is thus described: 'Johnson T. Worked about 1651-1675. Draughtsman. Made drawings of Canterbury etched by Daniel King for his *Cathedral and Conventual Churches of England and Wales*; possibly also the engraver of a mezzotint portrait of Bullock the Comedian.'

Johnson is referred to in Walpole's *Anecdotes of Painting* thus: 'T. Johnson made a draught of Canterbury in 1651 which hangs upon the stairs of the Library belonging to the Cathedral.'

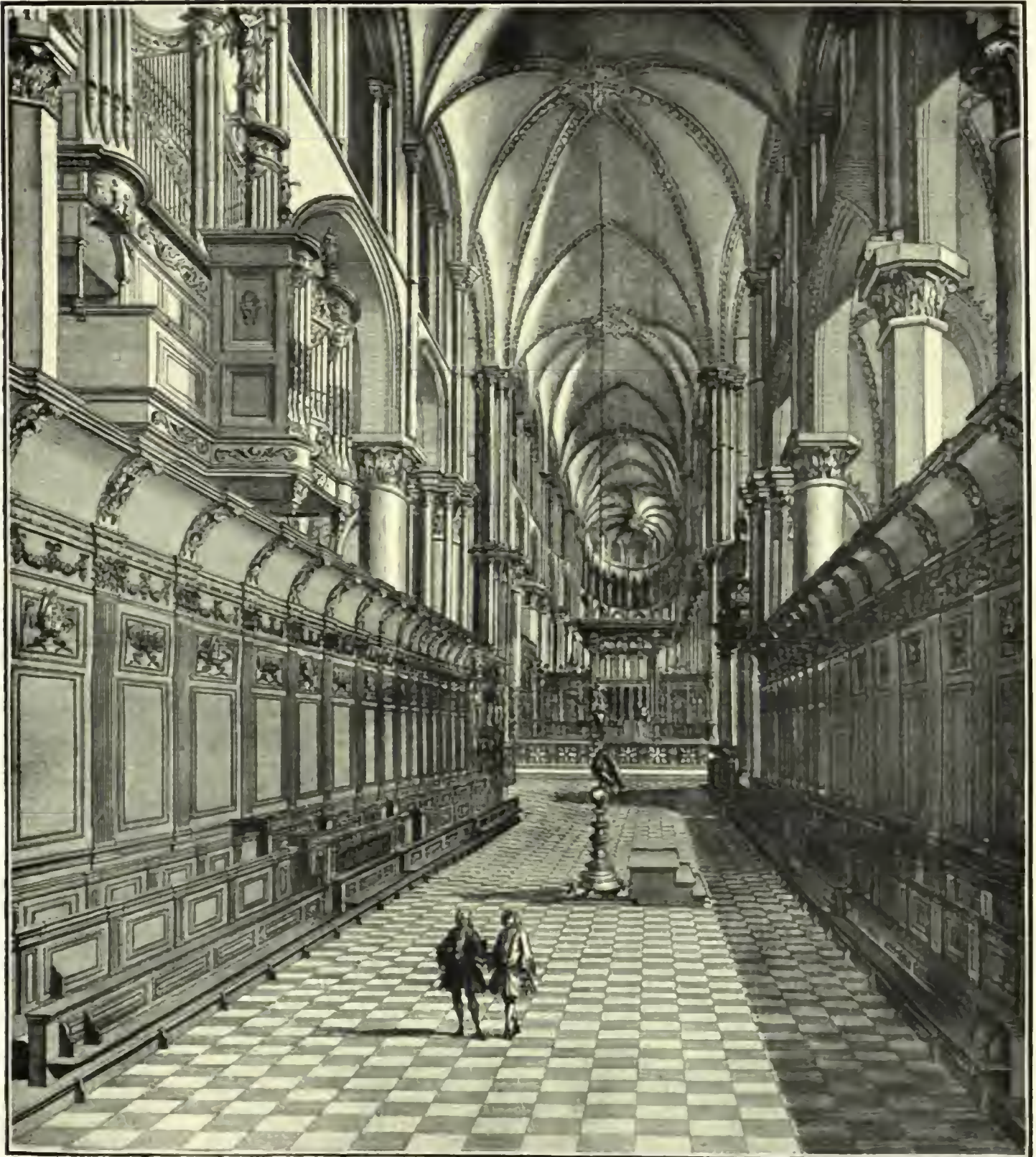
In Gough's *British Topography*, vol. i, p. 455, we find: 'Mr. Johnson of Canterbury showed the Royal Society, 1685, a curious prospect of the Cathedral, and several views of the adjacent country drawn by himself in oil colours. He made a draught of Canterbury 1651, which hangs on the Cathedral Library stairs.'

This entry is confirmed by reference to Birch's *History of the Royal Society*, vol. iv, p. 399 (1756), which gives the date May 13, and from which we learn that Samuel Pepys was President and Sir C. Wren a member of Council in that year, Sir Christopher having already passed the chair.

Johnson is frequently confused with another T. Johnson, a mezzotint engraver, who worked in Queen Anne's reign and later. Hence the last paragraph in the extract from Mr. Binyon.

Now both these pictures are painted from the top of Prior Chillenden's pulpitum, which is under the Angel Tower. The exact spots where the artists' easels rested are ascertainable. It will be observed, however, that both have taken a liberty with the science of perspective as expressed on paper. They have turned their heads to paint the two sides of the upper part of their pictures. On the north side the transverse lines vanish to the north, and on the south to the south. Si ars sit celare artem, all the more may we congratulate at least Johnson in having with no small success wrapped up this licence and

¹ Walpole, *Anecdotes*, ii, p. 123.



A PROSPECT OF THE CHOIR, c. 1716

Published by the Society of Antiquaries of London, 1911

S. Cole, sculp.

produced a singularly natural result, avoiding that perspectival distortion of which we are conscious only on paper or canvas.

In reference to the Clock House, we find the Angel Tower referred to as the Clock House, and indeed the words 'clock house' were used almost as a synonym for 'tower'. Battely says, *Antiquities of Canterbury*, 1703:¹ 'I find in an account made in the year 1316 that five bells were bought, the first was called Bell Thomas and dedicated to St. Thomas the Martyr which was hanged in the great steeple or Clock House and weighed 8000 pound.' We know also that there was a clock on the pulpitum from the drawing by James Cole in Dart,² c. 1726. The clock works would have been cased by a considerable enclosure, and we may I think assume that the pulpitum was intended by Johnson.

In 1292 Prior Eastry erected the 'Novum orologium magnum' at a cost of £30.

In the Sacrist's Inventories the clocks first appear in 1689: 'In the Quire one greate clocke and one quarter clocke.' The same entry occurs in 1735, 1745, and 1752, and no doubt in 1761, were not the greater part of that inventory missing.

A few general references to the picture's accuracy of detail are called for. The ornaments upon the groin ribs (billets, &c.) are correctly given. The capitals are admirably and accurately drawn. In one of them the angle of the abacus and foliage is shown flushed off, and the section is correctly drawn. Knowing from this picture of this defect, it is now possible to see where a repair has been effected, presumably by Austin. The number of squares in the pavement is correct. There was a small circular platform in the centre of the first step up to the sanctuary. This is clearly indicated, and part of the stone still exists. The number of divisions, and their disposition in regard to the pillars, of Prior Eastry's additions to the parclose screens is absolutely exact.

The hooks by which Prior Goldstone the second's and Richard Dering the cellarer's hangings depended on Eastry's screen are shown. These hooks were cut out by Austin and the pieces of stone then let in are now to be seen. There were four sets of hangings. Three sets were given by Goldstone on the south side, 'Tres pannos pulcherrimos opere de arysse subtiliter intextos ortum virginis cum vitâ et obitu ejusdem clare et splendide configurantes,' and inscribed 'Thomas Goldstone hujus ecclesiae Prior Sacraeque Theologiae Professor me fieri fecit Anno Dom. Millesimo quingentesimo undecimo' (1511). The fourth set was given by Richard Dering, and hung on the north side. It consisted of six pieces, with the story of Christ and Our Lady, and was inscribed 'Richardus Dering

¹ *Antiquities of Canterbury*, by Wm. Somner, revised by N. Battely, p. 23.

² *History and Antiquities of Canterbury Cathedral*, J. Dart, 1726.

hujus ecclesiae Commonachus et celerarius me fieri fecit Anno Dom. Millesimo quingentesimo undecimo.' The hangings, not quite complete, are now in part in the choir of the cathedral and in part in the Archbishop's Palace at Aix-en-Provence. A description of them by Dr. M. R. James, Provost of King's, appears in *Cambridge Antiquarian Society's Communications*, vol. xi, p. 506.

The hooks upon the pillars were doubtless for banners. They have been removed. The hooks shown under the clerestory string still remain *in situ*.

In the arcade the scale of the masonry is correctly given. Again, Anselm's rougher Norman work is differentiated from that erected after the fire of 1174, and we may note that the somewhat decayed archivolt of the window in the north aisle as shown by Johnson is now made up with modern plaster.

Wall-paintings now lost are shown on both outer walls of the aisles. On the north is apparently a pilgrimage to a shrine. In the background is a tower upon a conical hill which reminds one of Glastonbury Tor. On the south is a figure of Our Lord or a saint amid rays. Here we see clearly the coat of whitewash partly peeled off, and it appears that, although texture and jointing are shown by Johnson, he means to convey these as seen through the whitewash, and thus faithfully renders the surface in a somewhat pasty manner. Now, we have many references to the whitewashing of the interior from the thirteenth century onwards: thus in 1391-2 a receipt 'De Domino Priore [Chillenden] ad dealbacionem chori', and several similar entries totalling to the considerable sum, in those days, of £22 8s. 10d.

We have Chichele's monument, and Bouchier's monument, specially constructed, I may remind you, so as not to interrupt the light from a window in the north aisle shining upon the altar. Henry IV's monument is just indicated, and we see the back of the praying Wootten, first dean of the new dispensation. The ungainly chest tomb of Cardinal de Chastillon seems to have been in the same state in 1657 as now. The point of view allows us to see nothing more till we find Kempe's monument with its wooden canopy. The archbishop's throne is not.

The paintings upon and around the bosses of the roof generally appear disguised in various semi-classic forms in early drawings of the cathedral. Here we have probably a faithful record of their real form.

Other objects lost to us are here recorded. Woolnoth¹ refers to the stalls of the monks remaining till 1704, and Mr. St. John Hope's courtesy, coupled with his unrivalled knowledge of the cathedral and its documents, enables me to give a reference to the stalls from the Treasurer's Accounts, from which it appears that they were Prior Eastry's work as well as the screen behind them. Eastry was

¹ *Graphical Illustration of Cathedral Church of Canterbury*, W. Woolnoth, 1816, p. 44.



VIEW OF THE NAVE, 1816

From sketch by H. S. Storer

Published by the Society of Antiquaries of London, 1911

prior 1285-1331, and under date 1298-9 among the *Recepta de obventionibus* are these two items:

De Reginaldo Noldekyn—pro novis stallis in choro xx. li.

Pro novis stallis inferioris chori faciendis xvii. li. xviii. s. iii. d.

The histories of the pavement and also of Prior Eastry's screens are given by Gostling¹ (1796) and Willis² (1845), and need no fuller description here than that of the choir itself, so ably narrated by the latter, save to say that as Eastry erected his pulpitum and the north and south doors of his screens in 1304-5 it would seem that these were continuations of work commenced by him some six years earlier—a point not hitherto noticed.

The parclose screens were covered with panelling on the choir sides in 1676. On 2 August of that year Roger Davis, 'cittizen and joyner' of London, entered into articles of agreement with the Dean and Chapter for its execution. It is to be of as good materials & of such scantlings & thicknesses and in as good and workman-like manner as is the wainscott now made and sett up in the Mercers' greate Hall in London.

Payment is to be according to schedule: the wainscot, per yard, 15/-; each capital, 14/-; each mitre and palm, 14/-; the 'architrave, cornish and scrowles,' 1/6 per foot run. Davis undertakes at the signing of the contract to include the enrichment of the panel mouldings, and words are added to the articles. To these are attached a neatly-executed geometrical drawing, an interesting specimen of the draughtsmanship of the day. In 1682 Roger Davis entered into further articles for the erection of the stalls of the deans and prebends, still existing against the east side of Chillenden's pulpitum. The pillars of this work are described to be 'fluted according to the pilasters that are now up in the Quire with bases and capitals'. It is interesting to note that this work was executed in 'Dantzic' and 'Quinborough' oak, Queenborough no doubt being the port of entry for Baltic timber.

Further, the panelling of 1676 had not been extended westward beyond Eastry's screens, and there remained the two solid walls of the arcade responds to cover. In the second Roger Davis's agreement we read accordingly:

Two pieces of wainscott to be made, one on the North side and one on the South side which is to make good from the Prebends seats to the wainscott now up and done according to the said design, with the same carving and scantling as the other wainscott up the sides now set up.

¹ *A Walk in Canterbury*, Wm. Gostling, 1796, 4th ed.

² *The Architectural History of Canterbury Cathedral*, R. Willis, 1845.

These pieces of wainscot still exist *in situ*, but the other panelling referred to was used up in Captain Austin's house in the Precincts. Some five years ago it was recovered as far as possible, and it is now, in an incomplete state, stored in the cathedral. It is correctly drawn in Cole's plate in Dart, executed about 1716, although not published till 1726 (plate XLI).

The thirteenth-century stalls gave way to those shown by Dart in 1704-5. We find an agreement dated 7 Dec., 1704, between the Dean and Chapter and John Smallwell, citizen and joiner of London, who was at work also upon St. Paul's:

The said John shall set up two ranges of pews of good right wainscott well matched on each side of the Choir leading from the Dean and Prebends Stalls up to the Archbishop's throne in the said Choir with suitable benches before the outside pews for the choristers and Kings' Scholars . . . and the pews and benches to be finished as well and in a good workmanlike manner as the pews and benches that are in the Choir of the Cathedral of St. Paul, London. The price to be at the same rate as paid for timber work at St. Paul's. The old timber and wainscott now standing in the Choir to be used as far as possible.

The estimate was £300. These benches remained till 1879, when Sir G. G. Scott removed them, but the wainscot was removed in 1836 by Austin.

Iron Screens. The iron screen which closed the south aisle is clearly shown surmounted by a wooden cornice of Eastry's date. Part of this cornice is used up in a repair of the roof of the watching chamber over St. Anselm's Chapel. It was in existence when Storer made his plate in 1816 for Woolnoth¹ (plate XLII), at which time the organ was on the pulpitum. 'Over this Screen,' says Gostling,² 'is placed the organ which formerly stood in the Northern side of the Choir above the Stalls.' The iron screen which separated the choir from the Trinity Chapel is, I believe, correctly drawn by Johnson. It originally had a rich cornice, for it is referred to by Gostling³ as 'a fence of ironwork finished at the top with a rail or cornice of wood painted with some of those ridiculous and trifling fancies with which the monks were everywhere fond of making the preaching orders of friars appear as contemptible as they could'.

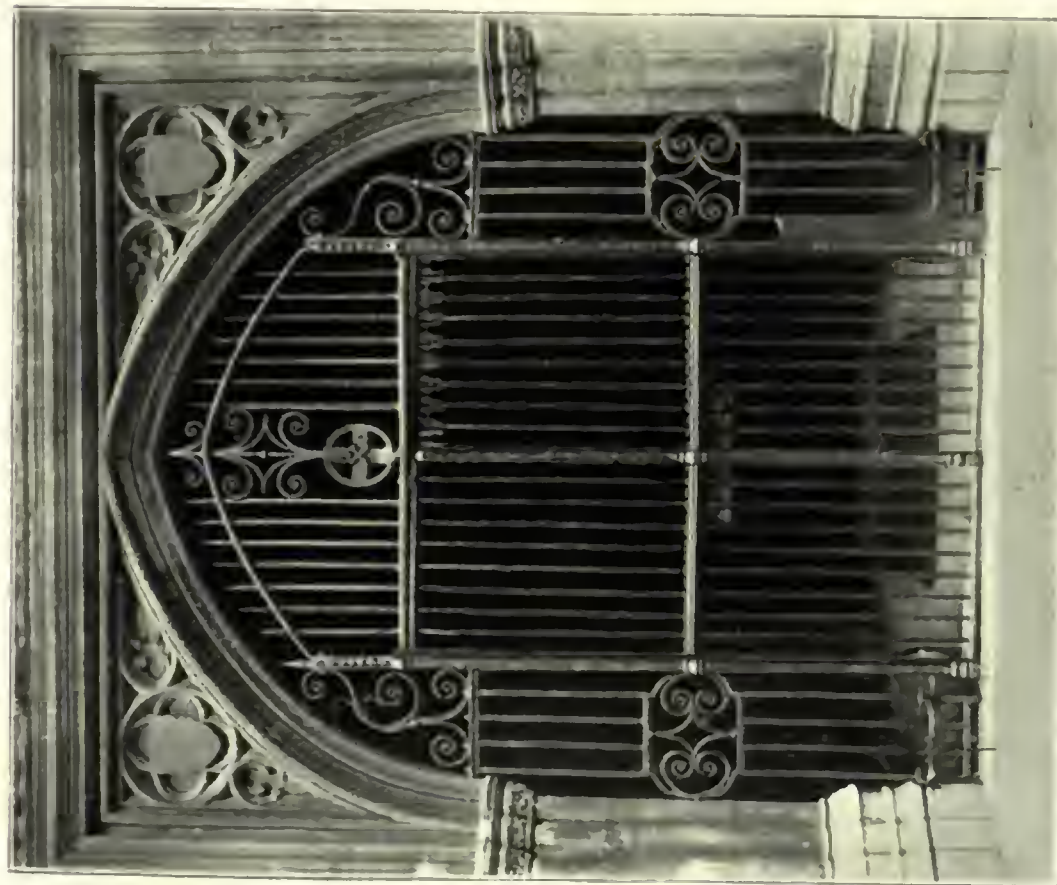
Somner³ (1640) has a reference to 'the grate between the Archiepiscopal Throne or marble chair . . . and Beckett's Chapel'. I show the two iron screens now at the south-west porch and west door (plate XLIII). From the Dean's book, 1748:

ordered y^t the iron rails which now divide the body from the other parts of the Church be taken down and set up again in the two porches with as little alteration as need be.

¹ Woolnoth, *Graphical Illustration of Cathedral Church of Canterbury*, p. 58.

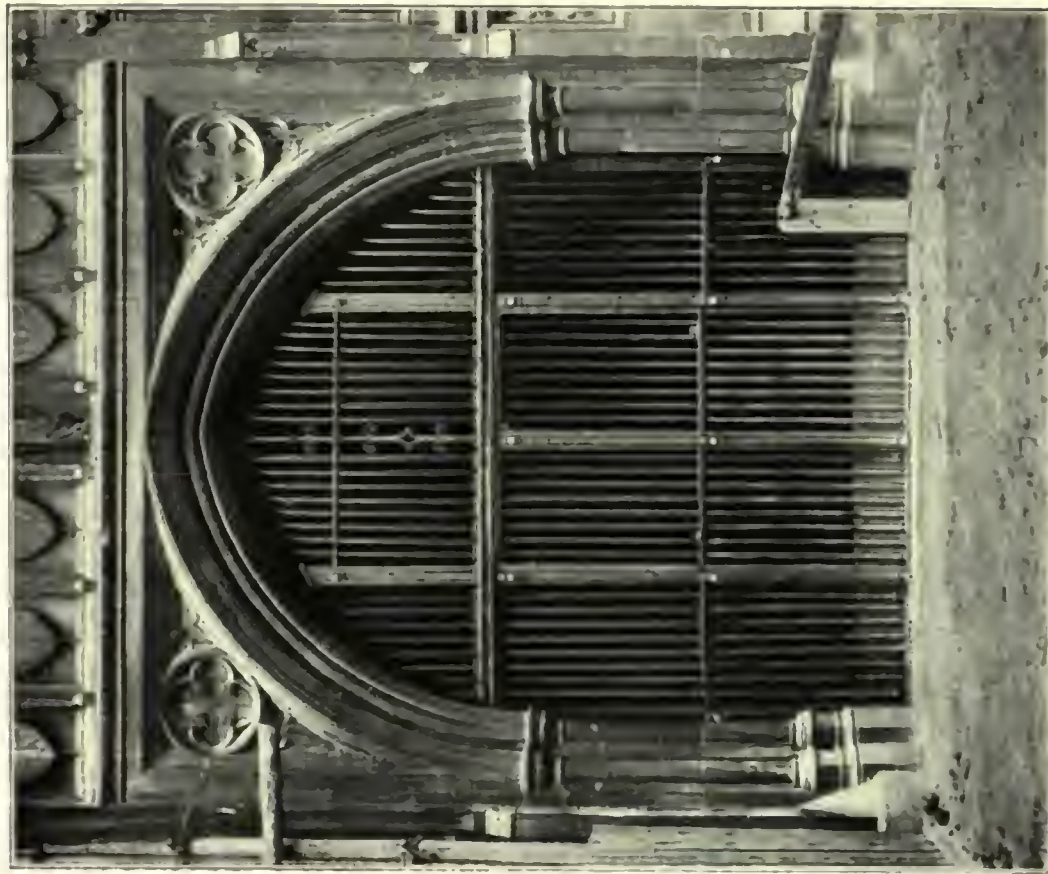
² Gostling, *A Walk in Canterbury*, p. 261.

³ Somner, *Antiquities of Canterbury*, 1st ed., 1640, p. 171.



IRON SCREEN NOW IN SOUTH-WEST PORCH

Phot. J. Charlton



IRON SCREEN NOW IN WEST ENTRANCE

Phot. J. Charlton

Published by the Society of Antiquaries of London, 1911

The alterations and adaptations executed in 1748 are clearly to be seen, and this entry accounts for the curious blending of the Gothic with the classic iron-work: both simple and good of their kind.

I pass now to a more difficult subject, the altar. Prior Chillenden is recorded in the Kalendar of Obits to have ornamented the high altar and the altars of St. Dunstan and St. Elphege. 'Majus vero altare cum duobus altaribus sanctorum Dunstani et Elphege opere argenteo aureo ac ligno subtiliter inciso decenter ornavit.' In a list of repair works by Chillenden we find 'the new Altar' coupled with those of St. Dunstan and St. Elphege, and a 'table' of silver and gilt. John Buckingham, Bishop of Lincoln, left £20 for building the high altar, and Richard II gave £1,000, part of which was 'ad fabricam summi altaris'. Leland refers to the 'Altar Waul', while the existence before the depredations of the Commonwealth of 'a goodly skreene of Tabernacle work' is amply recorded by writers of that period. There seems sufficient evidence to conclude that we owe to Chillenden the general arrangements of the high altar and reredos, which Mr. Hope suggests was 'a low wall like that still standing at Westminster Abbey, extending across the presbytery and enriched with tabernacle work and imagery on both sides'. On both sides of the altar would be doors leading to the space behind. This screen or wall survived the inroads of Henry VIII, although it met with vicissitudes which Laud endeavoured to repair by means of various furnishings. Richard Culmer, *alias* Blue Dick the iconoclast, is eloquent on this head. 'At the East end they (the Dean and Chapter) have placed an Altar as they call it dressed after the Romish fashion, for which Altar they have lately provided a most idolatrous costly glory cloth or back cloth.'

Colonel Sandys, however, in 1642, fifteen years before Johnson dated his picture, brought all this to an end in a summary manner with the aid of his troopers.

Blue Dick's *Cathedral News* tells us further: 'They hewed the Altar rails in pieces and threw the Altar over and over down the three Altar steps and left it lying with the heels upwards.' The sub-dean, Dr. Paske, writes: 'They defaced the goodly skreene of Tabernacle work . . . they further exercised their malice upon the arras hangings in the Quire, representing the whole story of our Saviour.' And, describing their losses after the Restoration, the Dean and Chapter refer to 'the Communion Table robbed of the skreene of Tabernacle worke, richly overlaid with gold behind it'. It is pleasant to notice that the abrasions of the step caused by the traffic passing through the screen doors are clearly shown by Johnson, and he also gives some indication of the position of

¹ Rd. Culmer, *Cathedral News*, 1644.

the altar and St. Dunstan's shrine. But no indication whatever is given of the screen itself or any part of it.

Now Thomas Turner being dean, we have the agreement made by the Dean and Chapter in 1664 (stated to be 'the seaventeenth year of King Charles II') with Peter Christopher Hartover of Deptford, painter, who covenants

to make frame erect and sett upp with additions of joyned and carved worke to be wrought and done in wainscott as are now in any part thereof wanting to the full compleateing and perfecting of the screene now standing and beeing upon the assent at the East end of the Quire of the sd Church—according to the forme, modell or designe thereof by him already taken downe and delivered to the sd Deene and Chapter. And the same additions and parts as now wanting being first so made fitted and erected, the same and all the rest or other partes already made and finished of the screene shall and will in and after the best and most workmanlike manner paint, colour, gild and embellish in all points and respects answerable and according to the forme, modell and designe.

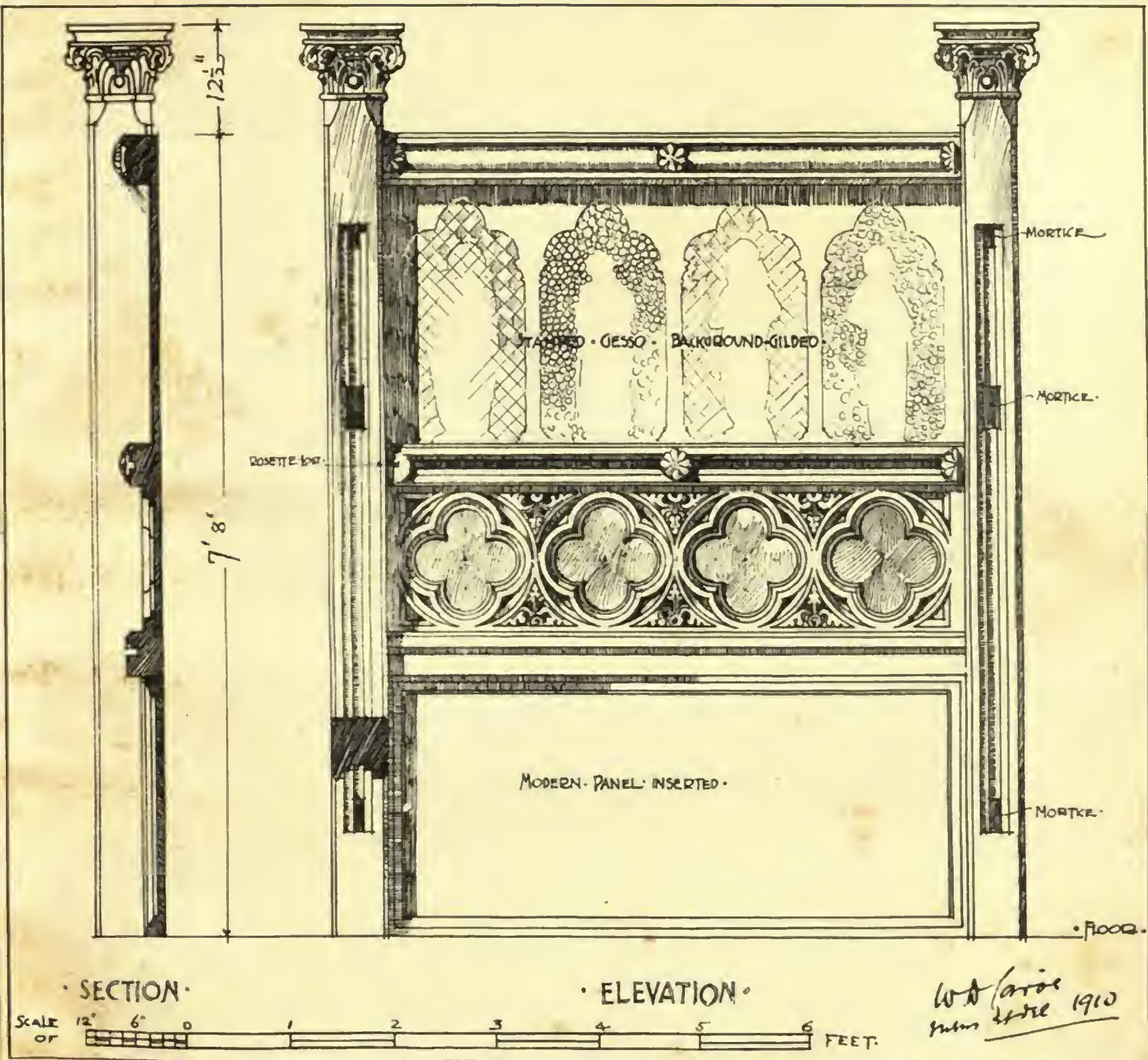
Hartover further undertakes to supply the want of the present altar cloth or front of purple velvet and crimson damask now used, and to paint the rail now standing before the ascent to the high altar, putting in the same with a stone colour laid in oils. For this work he is to receive £120, whereof £30 appears already to have been paid him for work done before the agreement, and there is an interesting proviso, which may be quoted: 'That by the judgment of artists and such as shall have skill to judge thereof it shall appear that the sd P. C. Hartover or his assigns shall have fully performed his and their bargain.'

It is not quite easy to understand this document. Something was standing by way of screen when this agreement was made, and whatever it was it was of wood. Was it any part of Chillenden's altar-piece, or was it some erection of Hartover's for which he had already been paid £30?

Now it is somewhat curious that most of the workmen employed in these works of refurnishing the cathedral came from the Thames' banks, where doubtless they learnt their trade in embellishing the warships of the day, and it is most unlikely that Hartover would have been skilled in tabernacle work of Chillenden's conception. I cannot but think that Hartover had erected, perhaps immediately after the Restoration, a small reredos, perhaps only a retable, costing £30, the inadequacy of which at once became apparent, when the further sum of £90 was spent upon it. The words 'other partes already made and finished of the screene' point to this.

In 1694 Thos. Lingall, joiner, does some work to the altar:

For a new canopy and two new pillars to bear it and two brasses behind the work and stuff 14s. 6d.



OAK FRAMING NOW AT ADISHAM

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The canopy and pillars duly appear in Cole's *View* (c. 1716) (plate XLI), but it is difficult to understand how they could have been erected for the sum named.

Mr. Woodruff, the cathedral sub-librarian, throws doubts upon the accuracy of Johnson's drawing, arguing that the agreement I have quoted points to considerable parts of Chillenden's altar-screen having survived the iconoclastic period. My own view agrees with Mr. Hope's, that this screen was of stone in the usual manner. Mr. Woodruff thinks it was of wood. Wooden altar-screens were certainly used in the cathedral. There is a fragment of a remarkable thirteenth-century wooden screen which Archdeacon Battely, brother of the historian, is said to have removed from an unknown place in the cathedral to furnish the altar of the fine church of Adisham, where he was rector from 1684 to 1708. It now stands in the south transept of that church, and is of course long antecedent to Chillenden (plate XLIV).

Furthermore, Mr. Woodruff relies upon the *Kalendar of Obits*, already quoted, 'ac ligno subtiliter inciso decenter ornavit,' and further, in relation to the altar of St. John Baptist, 'opere ligneo strenue decoravit.' But carved wood ornamenting the altars is no proof that the screen was of wood.

Battely¹ refers to what he says 'has been lately done in our days':

The most illustrious Queen Mary II of ever blessed memory who honoured this Church with her Royal presence provided the Altar as also the Archbishop's throne, the Stalls of the Dean and Vice Dean and the Pulpit of this Church with new and rich furniture.

Now this has frequently been read that she erected the altar-screen, for which there is no warrant at all. It might as well be said that she provided the stalls of the dean and the vice-dean, which we know were erected seven years before she came to the throne.

It is quite clear that Cole's drawing of 1716 (plate XLI) is correct as to the screen, because it appears again in Woolnoth in 1815 in like form, as seen from the back (plate XLV). I take the screen as thus shown by Cole in Dart to be Hartover's, possibly with Lingall's canopy added. We have no record whatever of Hartover's screen having been replaced by another before 1716. There is nothing in this even reminiscent of Chillenden, but it certainly possesses some spurious Gothic leanings, which were good enough for Gostling² in 1774. 'Opposite to the stone chair,' he says, 'we see the old Altar piece, now the lining of that to which it gave place in the year 1730. It is handsomely adorned

¹ *Antiquities of Canterbury*.

² *A Walk in Canterbury*, 1st ed.

with painting and gilding, and of a design which some think more suitable to a Gothic Cathedral than the new one.'

In 1732-3 what I believe to be Hartover's altar-piece was moved back to make way for this new one, to which it did accordingly form the lining.

From the Treasurer's Accounts:

1733. To the carpenter for work done to the frame, to set the old Altar piece on, and for putting up the old Altar piece, for 47 yards of wainscott done at the old Altar piece @ 2/6 per yard. £5 17s. 6d.

The contracts (which are extant) for the new altar-piece and for the wainscoting on the north and south sides of the choir from the eastern crossing to the altar-screen were entered into on June 24, 1731, Elias Sydall being dean; but the work was not completed till 1733. The design was by James Burrough, who became Master of Caius College, Cambridge, in 1754, well known as an amateur architect of the period (1691-1764). The joiner was John Balshaw, the carver John Bosun, both of Greenwich. The cost amounted to:

Joiner ...	...	...	...	...	...	£602	0	0
Carver ...	...	...	...	...	...	279	0	0
Gilder ...	...	...	...	...	...	13	3	0
Total						£894	3	0

What the amateur architect was paid does not appear.

In the view (plate XLV), the backs of both altar-pieces are shown. They were destroyed by Austin in about 1825, when the present piece of spurious Gothic synchronized with the falsification of the mediaeval scheme for this part of the church. This, which had survived with dignity all the changes and chances of Reformation, Renaissance, and Revolution, had to succumb at last to the milk and water of restoration, and all the indignity and inanity attaching thereto. The altar was elevated to the top of the ascent, where it has no business to be. The patriarchal chair had been dethroned somewhat earlier. The disposition of the steps was also altered for the worse.

It appears from Cole's drawing (plate XLI) that a black-and-white marble floor was laid over the old one when the classical stalls were introduced. The black-and-white marble pavement within the altar-rails was the gift of the widow of Dr. Thomas Nixon, 1729.



VII. FROM BECKETT'S CROWN. 1816

From sketch by H. S. Storer

Published by the Society of Antiquaries of London, 1911

No. 2. (PLATE XLVI.)

I pass now to the larger drawing, no. 2, which is the work of a painter aiming at effects of chiaroscuro rather than architectural accuracy.

In regard to his picture Dr. Mason writes to me :

I can ascertain nothing with regard to its history. I bought it from a man at Sudbury in Suffolk, to whose uncle it had been given in part payment of a debt, but he could not tell me who the debtor was nor how he came by it.

The picture evidently had the name of Pieter Neeffs upon it before it came into the possession of the man at Sudbury. Experts to whom I have shown it say that it cannot be by Pieter Neeffs, but I am not sure what the ground of their opinion is. Certainly it cannot be by the earlier of the two painters of that name. For one thing he is not known ever to have been in England. For another he died before the date which the picture represents. It represents a state of things somewhat later than yours. Above the old stalls panelling has been put against Eastry's screen, but not the panelling pictured in Dart and still (in part) preserved. An altar-piece has been erected, but not Queen Mary's. The picture cannot have been coloured on the spot though drawn there : the pattern of the floor is correctly drawn, but the floor was never laid in black and white. In agreement with yours, it shows that there was no mediaeval screen behind the altar. It shows, like yours, a screen across the south aisle.

Now the wainscot covering the arcade western responds, which was projected in 1682, is not shown, and it seems therefore that the drawing, at any rate, was made before that wainscot was executed. For certain reasons the picture is of doubtful accuracy as to details.

The organ is inaccurately drawn, but it is in the right place. The stalls are correct, but the panelling over them bears only a general resemblance to that of 1676 which it is obviously intended to represent.¹ The pavement is correctly drawn but wrongly coloured, as Canon Mason notes, and so on ; and of the gilded altar-piece and balustered altar-rails this picture is the only representation we have, to my knowledge, and I believe these features to be wholly imaginary, excepting perhaps the gilding.

Unfortunately, what might have been a test of the painter's accuracy just fails us. A gilded sun, with the sacred monogram in the centre, supported by three carved and gilded cherubs with expanded wings, was probably erected by Dean Turner, who was succeeded by Dean Tillotson in 1672. It was removed by Tillotson in 1680. Censured for the removal, Tillotson pleads 'we only took down the sun over the screen behind the Communion Table . . . nothing done besides, not so much as the table stirred out of its place'.

¹ If this be a correct surmise then the picture was painted between 1676 and 1682.

The sun went down to Henry IV's chantry, where it lay in 1799, when Hasted wrote his *History of Kent*. It does not occur in the larger painting, but if this was painted between 1680 and 1682 or 1683, we cannot on this score deny the picture's accuracy. If painted before 1680 the sun ought to have appeared.

The brass eagle, correctly given, dates from 1663, and was made by William Burroughs of London, who is not to be confounded with James Burrough, the Master of Caius College. Incidentally we have a third Mr. Burows referred to in 1694:

For an eight light window delivered to Mr. Burows glassed by the Treasurer's order 10/-.

It may be noted that the lower part of the iron screen behind the altar-piece is shown in twisted leafage, which is probably incorrect.

The choir panelling is shown without its upper panels, and the bracketing of the cornice differs. The pilasters are also omitted. I think we have in this and other matters a mere painter's licence. Similarly as to the wall-painting on the north wall, its existence is confirmed, but the painter has translated it into large figures of a man and woman. He has classicized the semi-Romanesque capitals, and built the piers in large equal blocks. As already said, the same disregard of technical perspective occurs as in Johnson. The organ, the contract and receipts for payments for the erection of which exist, is represented in the proper place. The builder was Launcelott Peace of Cambridge, and the date July 17, 1662. The choir organ was to be erected by Christmas, 1662, and the great organ by or before the like feast then next following. The cost was to be £600, with the existing organ thrown in. The total payment in nineteen instalments was £666, the final quittance dated July 1, 1664. Now this organ is to be 'sett up in the organ loft now standing in or by the Quire of the said Church'. Subsequently we find a reference to 'the present organ standing in the organ loft aforesaid', which is 'not to be taken downe untile the new one shall be ready and fitt to be set up in the roome thereof'.

Will Jordan, a joiner, employed directly by the Dean and Chapter, assisted Peace in the work. We have several of his accounts:

June 2nd, 1663. The Joyner's bill for works done and stuff about the organ. For cleaven yards of wainscott wrought on both sides at eleven shillings and sixpence the yard, £4 6s. 6d.

For carving of foure freazes about the wainscott at sixteen shillings a peece, £3 4s. 0d.

For carving of sixteen foote of water crease and beads at eightpence a foot, 10s. 8d.

And in November 21st, 1663—carving the cross somer tree to beare the great sound board in the organ loft 2/6, and for striking the scaffold over the organ loft.



CANTERBURY CHOIR

From a picture in possession of Canon Mason, probably painted between 1676 and 1682

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Now it has been assumed that the old organ was not wholly destroyed. Yet in the paper drawn up by the Dean and Chapter in 1660, describing their losses and needs, we read of 'The Quire stripped and robbed of her organ and organ loft'. Also they propose 'to carry on the work of perfecting the furniture of our Quire with an organ'.

It seems clear, then, that the organ-loft was erected very soon after 1660, and probably what was saved of the old organ reinstated for immediate needs until a complete instrument could be arranged for.

Our picture depicts the great organ front fairly accurately, but omits altogether the front of the *positif*, which is clearly given by Dart in Cole's drawing (plate XLI). It is quite possible, however, that this was a subsequent enlargement, though I can find no record of this. It would generally have contained the choir organ, erected, as we have seen, before the great organ.

It is possible to compare with these two views 'the modell scheme or figure' of the organ by Peace 'himself to the Dean and Chapter presented'. This is preserved to us in a rough draft on parchment, signed George Woodroffe (plate XLVII). Peace undertook to 'paint and gild the whole front thereof by and with the advice of artists or other judicious persons'. The executed work seems to have been more restrained and refined than this drawing would lead us to expect.

The organ-loft shown in the picture seems of the same design as that shown by Cole, although decorated by swags in the panels. The painter has raised the loft considerably above the screen work, and on the whole the two drawings can hardly be reconciled.

The earlier notices of the organs are as follows:

1540. 'In the Quire ij peire of organs.'

1584. 'In the chore A lyttle paire of orgaynes & a great' paire aboue.'

1634. 'A great organ in the quire.'

In 1635 the Lieutenant from Norwich heard 'the fayre organ, sweet and tunable'. Culmer¹ tells us that 'the zealous troopers began to play the tune of the zealous souldier on the organs or case of whistles which never were in tune since', which Dr. Paske, already quoted, confirms (1642) by stating that Colonel Sandys with his troops 'spoiled the organs'.

It may be mentioned that the remains of a small portable organ of Elizabethan date and charmingly designed existed until quite recently in a very dilapidated condition in the loft over the treasury. It has now been placed in the Library.

¹ *Cathedral Neues*, 1644, p. 19.

The general conclusion must be, that while of much interest and as a piece of effective painting greatly superior to Johnson, our second picture must have been painted away from the church, and the artist has filled in from his imagination some of the features of which he had not made careful notes, or has added others to suit his taste.

I have to express my indebtedness to Mr. Hope, Mr. Woodruff, and other helpers for assistance in putting together these notes.



PEACE'S DESIGN FOR THE ORGAN FRONT
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XVI.—*Exchequer Tallies.* By HILARY JENKINSON, Esq., B.A., F.S.A.

Read 26th January, 1911.

THE hoard of several hundred thirteenth-century Exchequer tallies, here brought to the notice of the Society, was found by the Office of Works during the recent repairs to the Chapel of the Pyx at Westminster, and transferred to the Public Record Office. A great deal of dust accompanied the tallies, and in this were found portions of some contemporary white leather bags of curious workmanship and a good many fragments of documents.¹ Some of these fragments were of widely different dates and classes, and it seems probable that the whole constituted a collection of the sweepings, as it were, of the many series which at different times found a home in that important repository of records.

The meaning of the word *tally* is sufficiently well known: starting with the idea of a stick notched for purposes of calculation, it early develops its full sense, used here—that of a stick notched and split through the notches, so that both parties to a transaction may have a part of the record. As Madox² says, ‘the origin of this was to prevent fraud’; but the device of the tally, split or unsplit, is so obvious and simple a one, and is found in so many parts of the world, that there seems to be no need to follow the suggestion put forward by Pollock and Maitland³ that the English tally is a rationalization of the Frankish *festuca*, the ceremonial wand or verge: this in spite of the undoubtedly Frankish origin of the constitution of the English king’s household, which is itself the origin of the Court of the King’s Exchequer. It may be added that the derivation usually given for the English *tally* and French *taille*—from the verb *tailler*, to cut—is incorrect. English Record Latin often spells the word *tallia*, but the proper form is *talea*; and this is good Latin for the slip inserted in a stock in grafting, and, further, for any long slip of wood. *Tailler* is derived from the verb *taliare*, itself probably derived from the substantive *talea*.

¹ e. g. some early Returns of Members of Parliament (*Eng. Hist. Rev.* April, 1910).

² Madox, *Hist. of the Exchequer*, ii. 258 (ed. 1769).

³ *Hist. of Eng. Law*, ii. 185.

The tally-stick, split or unsplit, is widely used: instances of it have been noted all over England and Europe, indeed all over the world, and in all kinds of trades. Illustrated here (plate XLVIII, fig. 1) are some tallies quite recently in use, no. 1 being an unsplit faggot-cutter's tally, and nos. 2, 3, and 4 split tallies from the Kentish hop-fields; and they are still in comparatively common use, to take only one instance, amongst bakers in France.

It would seem, however, that only England systematized the tally into an official instrument cut strictly according to certain rules—we have, as a nation, a genius for systematizing customary things: upon which account the writer inclines to refuse the theory that the official tally was a Norman importation. 'Tallies,' says Madox, 'were of great and constant use in the Exchequer, coeval for aught that I know with the Exchequer itself in England.' This is to speak rather loosely of the history of that office. Tallies, in some form, are undoubtedly older than the *Scaccarium*, the squared table-cloth, just as receipt is older than audit. 'What we now call the squared cloth of such-and-such a year,' says the *Dialogus*, 'was formerly called the Tallies of such-and-such a year.' It is not out of place to note here that the highly important, though somewhat neglected, *Receipt Roll* is, in origin, no more than a register of tallies issued: and the same form of words is invariably used in both. At the same time there is no doubt that the development of the tally into a highly organized instrument went with, and was conditioned by, the organization and growth of the Exchequer system.

Once discovered, it is not surprising that the use of the tally in its most perfected form should have been rapidly popularized. As a financial instrument and evidence it was at once adaptable, light in weight and small in size, easy to understand and practically incapable of fraud. Doubtless the 'profer' system, under which the sheriffs, the chief accounting officers, paid in at Easter sums on an account which was not audited till Michaelmas, gave additional popularity to this handy and durable form of receipt: and the process could be continued lower down the scale in private tallies between the sheriff and minor accountants. At any rate, by the time that the *Dialogus de Scaccario*¹ was written, that is to say by the middle of the twelfth century, there was a well-organized and well-understood system of tally cutting at the Exchequer. So far as form was concerned, there was now very little to be added, and the conventions remained unaltered and in continuous use from that time down to the nineteenth century. By statute of 23 George III (1783) the use of tallies was abolished, an indented cheque receipt being substituted for them (there is little doubt, by the way, that the form of the

¹ The edition quoted here is that of Hughes, Crump, and Johnson.



Fig. 1. Modern Private Tallies. 1



Fig. 2. Exchequer Tallies, thirteenth century. 1

indenture was copied from that of the tally¹): but this statute was not to take effect till 'the death or surrender of the then two chamberlains', and tallies continued to be cut till October, 1826. After the further statute of 4 and 5 William IV the destruction of the official collection of old tallies was ordered, and according to the well-known story the imprudent zeal with which this order was carried out caused the fire which destroyed the Houses of Parliament in 1834. So that tallies perished gloriously.

We must not omit to mention that the *Dialogus* shows us an establishment of offices connected with the tally as complete in its way as the conventions of tally cutting; and the historical descent of both to modern times is almost equally regular. Thus reference has been made to the chamberlains whose life prolonged the life of the tally; and from the earliest times of which we have knowledge the lower Exchequer or Exchequer of receipt—the Exchequer of tallies, as it might almost be called—was presided over by the chamberlains or their deputies in concert with the treasurer: the treasurer, being a clerk, had particular control over the rolls of receipt; the chamberlains, as laymen, over the cutting of the original receipts or tallies. And, to take another instance, the usher of the Exchequer was still supplying the material for the Exchequer tallies at the time of their abolition,² just as his predecessor was doing (for the sum of five shillings a year) at the time of the *Dialogus*.³

The purpose of this article is to deal principally with the method of cutting Exchequer tallies: it is not intended to treat of the many uses to which they were put between 1150 and 1820; though these ought to figure more largely than they have hitherto done in any history of English currency or finance. It must, however, call attention to one matter which is not a matter of form, one change which came over their usage, because on this is based their whole claim to attention, apart from their sentimental interest, as things practically important in English history. This change, which has been, in the past, undeservedly neglected by students, consists, to put it briefly, in the discovery that the tally of receipt might be used for purposes of issue. In conception it is purely a receipt, an original receipt, which, so far as Exchequer business was concerned, contained as a rule no information which could not be more conveniently obtained from the Receipt Rolls on which it was registered. But, obviously, if *A* owes *X* money and *X* owes *B* money, *X* can pay the creditor with a cheque on the debtor: let him make out a receipt to *A* and give it to *B*, and let *B* not part with it until he has obtained the money. If *X* is the Government it can easily

¹ It may be suggested that the tally convention is also responsible, among other things, for the term 'stocks' and for the cheque system.

² *i.e.* in 1783.

³ *Dialogus*, ed. cit. p. 65.

compel *B* thus to take upon him the trouble of collecting its debts, and much is no doubt gained by this simplification of public business. Three things result from this: (1) the tally, still in form a receipt, may and frequently does become in reality a cheque payable to bearer; (2) the registration of receipts at the Exchequer may be fictitious, or rather the double business of receipt and issue may be simplified into a single process; and (3) practically the whole business of the Exchequer may be transacted without money passing at all.

We cannot now give in detail the history of this remarkable and important financial development. It is clear, however, that a radical change was effected both in the form and in the spirit of the Exchequer's financial transactions with its accountants. They were simplified out of their primitive simplicity and direct personal payment upon the one side or the other often disappeared entirely: only the shape these transactions took, when they were reduced to records, was, with a typical conservatism, preserved unaltered—the old form of wording of the tally persisted and, as far as the fictitious receipts were concerned, so did that of the Receipt Roll.

The last words require some explanation. The tally of receipt was probably used on occasion for purposes of issue quite early in its history. There is at any rate an instance in the thirty-fifth year of Edward I, when William Trete, the king's butler, having occasion for money, was given a tally of receipt in the name of the citizens of London, who owed a large sum on account of aids and from whom he was to obtain the payment: it was thought necessary, however, on this occasion, to address a writ of explanation to the citizens.¹ About the year 1320 or very soon after, the practice of issuing money in this way was fully established; and about 1350 it became the custom to add at the side of the conventional entry on the Receipt Roll—e.g. *De . . . vicecomite de firma comitatus . . .*—either the word *sol'*, denoting that the sum had actually been paid into the Exchequer, or a note of the other transaction that had taken place, namely the issue of this sum by tally to some official or creditor of the crown. By way of illustration we may take, at hazard, a passage from the Receipt Roll of 1444,² the first entry under date July 11th (*Die Jovis xj^o die Julij*), which runs as follows:

Sussex. De Johanne Perpount et Johanne Yerman collectoribus customarum et subsidiorum domini Regis in portu ville Cicestrie vij libras de eisdem customis et subsidiis.

(Sussex. From John Perpount and John Yerman, collectors of the king's customs and subsidies in the port of the town of Chichester, £7 of the said customs and subsidies.)

¹ Madox, *op. cit.* p. 260.

² Exch. of Receipt, *Receipt Roll* (Pells), 563.

In the right-hand margin is added this note :—

pro domino de Bouchier per restitutionem vnus tallie videlicet xvij^o die Februarii anno xxij^o Regis nunc leuate per manus Ricardi Wode.

(for Lord Bouchier by return of one tally, to wit one levied on the 17th day of February in the 23rd year of the present king, by the hands of Richard Wode.)

Of course, John Perpount and John Yerman had never paid this sum into the Treasury: the case was simply that £7 was wanted *pro domino de Bouchier*. The ensuing entries for a considerable way down the Roll are of the same kind and accompanied by similar notes; and these notes are reproduced in the same order under the same date upon the Issue Roll. It will be seen from the entry just quoted that Lord Bouchier had had already some difficulty in obtaining his money. By way of illustration of this we may take a single case—that of the Florentine firm of merchants called the Peruchi—a hundred years earlier, in 1339. This firm had advanced £4,000 on the security of certain taxes and they received on account two tallies amounting to £700 upon the collectors of taxes in Northumberland. Fortunately they had themselves contracted two debts for 400 marks and 200 marks respectively with John de Eston in his capacity as Receiver for Queen Philippa and in his private capacity: they therefore were able to cast back the responsibility of collection upon that official.¹ Under such circumstances as these the Receipt Roll was really unnecessary. But of course this was an extreme case; it did not always happen that the Exchequer was so hard pressed for money.

The practice, then, of making issues by tallies of receipt continued in use with modifications up to the end of the seventeenth century: Pepys, for instance, is continually referring to payments at the Exchequer made to him by tally, to the inconvenience of the system, and to the slowness and unresponsiveness of the clerks who administered it. At this time the goldsmiths, who then carried on something like a banker's business, would discount tallies, and on one occasion the king caused a panic by stopping the Exchequer, *i.e.* declaring tallies void. The system of issue probably began to collapse at the beginning of the following century with the establishment of banks—in particular of the Bank of England—but the Receipt Rolls or Receipt Books and the tallies of receipt went on in their old form for a hundred years more.

To return to the subject of tally cutting proper. It may seem remarkable, and is an evidence of the completeness of the destruction in 1834, that an exact account of tally cutting should have been hard to obtain. There has been no lack of inquiry. The literature upon the subject may be divided into two classes: (1) the

¹ Exchequer, *L. T. R. Memoranda R.* 115, *Hil. Rec.* ro. 3.

Dialogus de Scaccario with one or two treatises which deal with the account there given; and (2) all the rest. Of the first of these the writer has to say something presently. The second consists of questions, answers, and descriptions, spread over all the ten collections of *Notes and Queries*,¹ and of casual references in various works, such as Beatson's *Political Index*, Chambers's *Book of Days*, and Stubbs's *Constitutional History*;² of an article in the *Illustrated London News* of 1858, which is copied, together with a rather difficult illustration there given, in Dr. Cunningham's *Growth of English Industry and Commerce*;³ of some remarks in Lord Avebury's book on coinage and currency, with a picture of a late private tally; of an undated and anonymous broadsheet, a copy of which is at Kew Gardens, apparently published soon after the fire and containing among other matter mention of two curious tallies, one being a receipt for money paid 'for conscience sake' and one a tally for one farthing;⁴ of the notes upon tallies shown before this society, for instance, an early private one shown by Mr. Baildon;⁵ of the recent paper of Mr. Norman before the Archaeological Institute⁶ upon some late Exchequer tallies found at Martin's Bank, some of which, by the kindness of the Bank, are illustrated here (plate LI, fig. 1); of the notes in Mr. Hall's *Antiquities of the Exchequer*; and of some remarks in an official report published by H. W. Chisholm in 1869,⁷ most of them borrowed from an appendix to the Deputy Keeper's fourth report.⁸ Some of these accounts contain a good deal of inaccuracy. The difficulty in the case of all such as dealt with the Exchequer tally—and only the Exchequer tally has a definitely fixed form—has been the same as that which affected those who commented on the passage from the *Dialogus*; in the words of the latest editors of that treatise, 'no tally that we have seen seems to be cut exactly in the way here described';⁹ this being because no collection of really early Exchequer tallies was available.

It remains to explain the rules upon which tally cutting was conducted. The passage in the *Dialogus* runs as follows:

Now as we have mentioned tallies consider briefly the fashion after which the making of them is ordered. There is one tally which is so called simply, another which we name a Memoranda Tally. Properly the length of a tally is from the tip of the index finger to the tip of the thumb extended. There [*i. e.* at one (the left) end] it is pierced with a small (*modico*) hole. The Memoranda Tally, which is always made for the farm that is

¹ None of these are of very great importance, except that referred to in note 4 below.

² Ed. 1896, vol. i, p. 410.

³ p. 157.

⁴ See *N. and Q.* ser. vi, vol. iv, p. 492.

⁵ *Proceedings*, vol. xv, p. 313.

⁶ *Archaeological Journal*, vol. 59, p. 288.

⁷ *Parl. Rep. on Public Income and Expenditure*, part ii, app. 13, p. 339.

⁸ App. ii, p. 166.

⁹ Ed. cit., p. 42.

to be blanced (*firma blanca*), is a little shorter because after the assay has been made by which the farm is blanced this first tally is broken and, by the addition of the length of the combustion tally, then first attains (*meretur*) the [proper] length of a tally.

The cutting is done thus. At the top (*in summo*) they put thousands of pounds in fashion so that the cut for it will take the thickness of the palm of the hand, 100*l.* the breadth of the thumb, 20*l.* that of the little finger; the cut for 1*l.* is of the thickness of a grain of ripe barley; for 1*s.* less, yet so that by the two converging cuts something is removed and a small notch made; a penny is marked by a single cut, nothing being removed. On the edge where a thousand is cut you shall put no other number save the half of a thousand, in fashion so that you remove the half of the cut, placing this lower [on the tally]. The same method is observed if you are to cut a hundred and there is no thousand; so also shall you do for 20*l.* or for 20*s.*, which we call a pound. If there are many thousands or hundreds or scores of pounds to be cut the same rule is observed, that on the more open side of the tally, that is to say the side which is immediately before you (*directe proponitur*) when the note has been made, the greater number, on the other side the smaller is to be inscribed. On the more open side the greater number is always at the top, on the less open the smaller number [that is the pence¹]. There is, at the Exchequer, no cut signifying specially (*sola significativa*) a mark of silver; it is denoted by shillings. A mark of gold you must cut in the middle of the tally like a pound. The gold penny you must not cut like the silver one, but with the cutter's knife put straight (*ducto directe*) through the middle of the tally, not obliquely (*obliquando*) as is done with the silver penny. Thus the disposition of their places and the difference of their cutting determines which is gold and which is silver.

But you will understand all this better by seeing than by being told.

It is perhaps not surprising that the *Discipulus* accepted this view and pressed for a resumption of other topics.

Before introducing examples to illustrate this passage, it would be well to add an explanation of one or two facts not mentioned by the author of the *Dialogus*.

(1) The form of wording used on the tally is invariable—it is the same as that used in the Receipt Roll or, in the eighteenth and nineteenth centuries, the Receipt Book.²

(2) The Exchequer tally was usually made of hazel: willow and other woods are mentioned by authorities, but the writer has seen no examples, ancient or modern.

¹ This is probably a gloss, though the information conveyed is correct. See note on plate XLIX (2), below p. 377.

² The very name of the early Receipt Roll (of parchment)—*Pellis Recepte*—is perpetuated in the nineteenth-century Receipt Book (of paper). Both tallies and the Records of the Exchequer of Receipt are remarkable, even among English archives, for their preservation of old conventions. See, below (p. 377), the remarks on plate L (2).

(3) The angles of cutting at both ends and in the half-way cut¹ follow an unvarying rule.

(4) The two parts of the tally had names: the larger was normally called the stock (*stipes*), the smaller the foil (*folium*): the stock went with the payer, the accountant; the Exchequer kept the foil. Apparently when the account was finally made up the stock was returned to the Exchequer. Curiously, all those found are stocks. The stock is also called sometimes the *chacia* or the *scacchia*, and the foil sometimes *contratallia*, the counter tally. The description of the *Dialogus* applies throughout to the tally proper, given to the accountant—the stock.

(5) The *Dialogus* makes no mention of any provision against either fraud or accident. The former was obviously hopeless if the Exchequer did its duty, but we have cases where it was attempted: for instance, in 1297 William de Brochese, being entrusted by the sheriff with 60s. in cash and a tally showing 5 marks already paid in, to be taken to the Exchequer, added the 60s. to the notches on the tally and kept the cash, he was discovered, and sentenced to go to prison for a year and a day.² Again, we have an instance of the same period where a piece representing 4d. was broken off a counterfoil at the Exchequer: it was decided that it must be mended.³ Losses were not uncommon—we have one instance where a tally was lost twice—and after a time it was decreed, by a statute of 14 Edward I, that on such occasions the tally should be, with due formality, renewed, and the matter entered on a roll.⁴ These rolls continued to be kept at least as late as the end of the seventeenth century.⁵

(6) Other points with regard to tallies were regulated during the reign of Edward I, which seems to have been as formative in this as in more important matters. There was, for instance, the Statute of Rhuddlan, in 12 Edward I, dealing with the conduct of Exchequer matters between the sheriff and minor accountants, and in the Year Book for 20 and 21 Edward I⁶ is to be noticed an important case touching the legal value and admissibility of the tally. More important than these for our present purpose are two changes illustrated in plate XLVIII, fig. 2. To begin with, the tally had no indication either of date or of the locality concerned. In this it is naturally paralleled by the Receipt Roll (itself,

¹ *i.e.* the cut (an English characteristic) half through the tally: this cut arrests the progress of the longitudinal slit when the latter has traversed about two-thirds of the tally, as may be seen in the illustrations.

² Madox, *loc. cit.*

³ *Ibid.*

⁴ *Ibid.*: Ryley, *Placita Parliamentaria*, p. 450.

⁵ They are the *Tallie Immovalis Rolls* of the department of the Exchequer of Receipt.

⁶ *Year Books*, Rolls Series, 20 and 21 Edward I, p. 68.



Fig. 1

Exchequer Tallies, thirteenth century. About 1/2



Fig. 2

as stated above, in essence no more than a register of tallies), which begins by being, in the early part of the reign of Henry III, a mere collection of entries of receipts, several columns to a membrane, grouped, it is true, under general headings of counties, but having no indication of date. The tally naturally could not come under a general heading, but gradually a Receipt Roll appeared in which the entries were made in one column according to the date of receipt, under which arrangement it was of course necessary to identify by a note the county of each entry as it was made: probably the county appeared on the tally (plate XLVIII, fig. 2, no. 5) when the newer finally ousted—early in the reign of Edward I—the older form of roll. The term and year were added (no. 7) according to a definite order made in the 19th year of Edward I by the Barons of the Exchequer.¹ But the writer has seen tallies with the year written in here before that date.

It remains to mention in this connexion the *pro* and *sol* development to which reference has already been made, and which is also dealt with in the Deputy Keeper's report and in Chisholm's remarks. There can be little doubt that some time near to the earliest date at which the entry *sol* occurs on the Receipt Roll saw also its first appearance on the tally; it was apparently written on the upper² of the two notched edges, on which portion it appears here. On the *pro* tally, the *pro* note was apparently written in the same place as that in which it occurred on the Roll, *i.e.* on the right-hand side; it was, unlike the *sol*, on the same face as the annotation. *Pro* tallies are not common. The suggestion of the Deputy Keeper's report and Chisholm is apparently that an alteration of the whole wording was made, under which the receipt convention *De so-and-so . . .* would have disappeared. The writer has seen no instance of this, but he has seen an example where the *pro* note was *added*, as in the Receipt Roll, and believes, therefore, that this was the form used. At one time the tallies upon the Exchequer's debtors seem to have been issued not directly to the officials or others who required payments, but to intermediaries: this proceeding may have affected the form, but of this, again, there is no evidence.

It should be mentioned that plate L, fig. 1, and the illustrations of Chisholm and Cunningham represent the only foils of Exchequer tallies the writer has seen: if usage were as constant in this as in other particulars, it would seem that the writing on the foil was the opposite way up to that on the tally proper (the stock): this view is supported by an early tally, recently found, on which a portion that should have been split off has remained; on this side of the foil (as it should be)

¹ Enrolled on *Receipt Roll*, Pells, 73, m. 5.

² Upper, that is, with regard to the inscription on the stock or tally proper.

is a note of the date, immediately under the same note on the stock. Supposing the clerk to inscribe first the accountant's name on the face of the stock, and then, turning the tally over, to write both dates on the lower of the two notched sides (*i.e.* the lower side of the stock), he would then, turning once more in the same direction, write the duplicate of the first inscription on the face of the foil in this reverse way.¹

Coming now to the illustration of the *Dialogus* passage by our plates.

Plate XLVIII, fig. 2, besides the points mentioned, gives some idea of the length of the normal tally as described in the *Dialogus*. No. 4 shows the hole which is found in the thick part of most tally stocks, together with the thread used to tie the stocks together. This is not, probably, the *modico terebro* of the passage in the *Dialogus*: that hole is represented by the one seen at the left-hand end of the split part in no. 3; apparently before the split was made a hole was pierced—perhaps for gauging purposes—rather more than half-way through the whole piece of wood: the piece which, split off, became the foil was completely perforated, while the stock was left with the mark seen in this illustration. No. 8 shows, on the extreme right, the letters *bte* written, an indication that the amount notched on this tally had been blanchied. Reference may here be made to the statement at the end of the first paragraph of our *Dialogus* passage: this seems to be, in fact, an example of the tally which has 'attained the proper length of a tally' after combustion of the amount originally paid in.²

Plate XLIX shows, in no. 9, an example of the rare *contra* tally. Possibly this solves the question how issues were made before the system arose of using ordinary receipt tallies for the purpose. While in the possession of the accountant to whom payment was to be made this tally, inscribed simply *contra Edwardum de Westmonasterio*, with a note of the date, constituted a cheque payable to bearer; given up at the Exchequer in exchange for cash it became a record of payment made. No. 10 shows two of the marks for £1,000 made, as the *Dialogus* says, *in summo*, at the top of the tally—in the case of the stock the right-hand end. No. 11 gives us the mark for £100: note that it is made (perhaps in order to distinguish it from the £1,000 mark) with a curve, not with two straight cuts forming an angle. No. 12 shows two of the marks for a score of pounds. No. 13 has ten £1 marks. No. 14 seventeen for one shilling. No. 15 eleven for one penny—marks made by a single cut which removes no wood. Note that the amounts on all these tallies are cut in the same place—the 'top'

¹ *i.e.* supposing the amount noted on the tally to be £11 11s. 11d., the £11 would appear on the lower side of the inscription on the stock, the 11s. 11d. on the upper. In the case of the foil the positions would be reversed, though the cuts would still be at the right-hand end of the inscription.

² See the Introduction to the *Dialogus* (ed. cit.), p. 28.

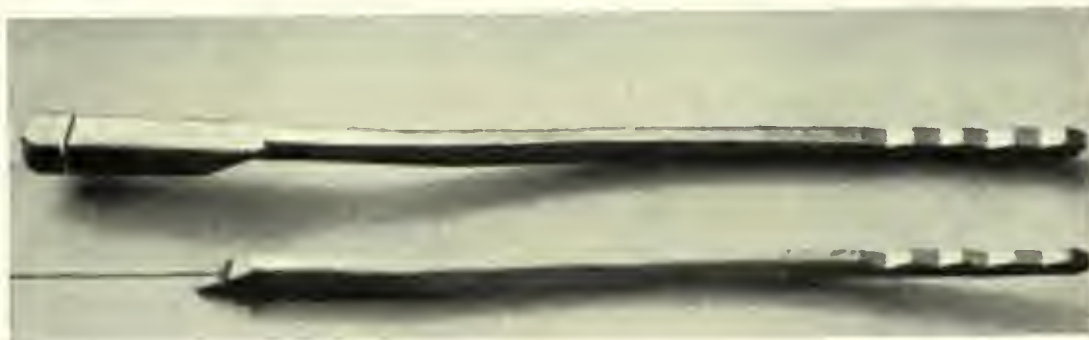


Fig. 1. Exchequer Tally: stock and foil; nineteenth century. About 1



Fig. 2. Exchequer Tallies, thirteenth and nineteenth centuries. About 1

end of the lower side—according to the rule given in our passage, because none of these tallies contains any amount of a higher denomination than those here mentioned. If, for instance, on no. 12 there had been £100 as well as the two score here seen, the £100 would have occupied the place of honour and the score marks would have gone to the upper edge. Nos. 16 and 17 show, on the left of the others, the half mark indicating respectively £10 and ten shillings. No. 16 has four and a half score pounds, no. 17 sixteen and a half pounds.

Nos. 18 to 24 f, Plate XLIX, show the arrangements made when more than one kind of cut appears on a single tally. 'On the more open side,' says the *Dialogus*, meaning 'the side nearest to any one holding and reading the stock,' 'the greater number is always at the top: on the less open the smaller number'; to which a later writer has added what is probably a gloss, 'that is the pence.' The fact is that this place is usually reserved for the pence: even if there are none the shillings or pounds are kept further to the left as in no. 19, which has four score pounds below and £5, with no shillings or pence, above. No. 18, with its scores immediately over the £100, is an exception. No. 20 shows a normal arrangement of (eleven) pounds, (five) shillings and (eight) pence, no. 21 a like proceeding with regard to (thirteen) shillings and (four) pence: the amount shown in this last (a mark) is, either by itself or in a multiple, very common. No. 22 shows the pennies on the 'more open side', and nos. 23 and 24 are interesting for the lengthy sums shown—£116 (£100 below and £16 above) 9s. and 8d., and £26 13s. 4d. (below £20 and above £6½, 3s., and 4d.) respectively.

The writer has found in the tallies he has handled no sign of the methods described by the *Dialogus* as proper to the marking of a gold mark or the gold penny. There would indeed be little necessity for this, England having no gold coin of her own for a considerable time after this passage was written, and other cutting arrangements proving sufficient throughout the life of tallies for the amount it was desired to mark on them.

Plate L, fig. 1, is the example of a perfect, though late, tally and foil already referred to.

Plate L, fig. 2. We have here two late Exchequer tallies, from a collection in the Public Record Office, together with two of the thirteenth century for purposes of comparison. It will be seen that the later examples are almost exactly similar to those of the thirteenth century. They are of hazel wood; they have the characteristic angles of cutting at the bottom and at the half cut and the characteristic top. The inscription runs: *De S. R. Lushington et Geo. Harrison armigeris pro proficuis pretii extraordinarii super billas de scaccario venditis pro publico in mensibus Septembris, Octobris et Novembris 1817.* They have *Magna Britannia*—replacing the old *Anglia*—as a sign that the account was not a purely local or county affair

—in the proper place at the top of the tally, and the date of entry—April, 1817—in the proper place on another side: and just as the transaction recorded on an early tally is entered in the same words in the Receipt Roll, so this entry occurs in the same words in the Receipt Book—the direct descendant of the Receipt Roll. The cutting is made according to the old rules as far as position is concerned. The notches of the shillings have slightly and the other notches very slightly broadened. Chisholm, who had an official connexion with the department which used to produce tallies, alludes to a standard measurement of these by inches and parts of an inch. He alludes also to a round hole indicating a half-penny (it is difficult to see how this could have been divided in the notching), but not to the written farthing: he says nothing about the placing of the notches. He states that the length was limited to 5 feet: and apparently it was not usual to cut more than £25,000 on one tally. The enormously increased length was a fairly early development, due a little perhaps to the greater length of the annotation and the increased size of writing, but mainly to the greater number of thousands the tally cutter might be required to put in. The writer has seen parts of a tally of the reign of Charles II which must have been quite 2 feet long, and has a reference to an Elizabethan one measuring 16½ inches. By Queen Anne's time—represented here by the tallies kindly lent by Martin's Bank (plate LI, fig. 1)—a rather long tally was quite unnecessarily used for comparatively small amounts.

Plate LI, fig. 2. The first seven tallies on this plate are shown rather for the interest of their inscriptions than for the fashion of their cutting. The first six record receipts from Jews 'of the tallage of 20,000 marks': the Jews have added or caused to be added writing in their own script. Generally this is merely a repetition of the name already inscribed in Latin; but on one there appears, besides the name of the owner (Delacriss), the words 'mimattenath yesrim eleph' (of the gift of 20,000), again a repetition of the ordinary inscription but going further than the others.

The seventh tally is of interest as bearing the inscription *De Johanne de Abernun de proficuo Comitatus*. This is the Sir John d'Abernon whose brass, the oldest in England, is at Stoke d'Abernon.

Included in this plate are four small private tallies by way of comparison. They are interesting for their curious shapes and sizes and their early date. And, though it is not quite relevant to our subject, we may perhaps conclude with a note on the subject of early private tallies. The present four are from an original file of fourteen to which is attached a schedule noting that they belong to the last four years of the reign of Edward I and relate to prises of wine made for his son the Prince of Wales.

Subject to correction the writer would make the following remarks upon

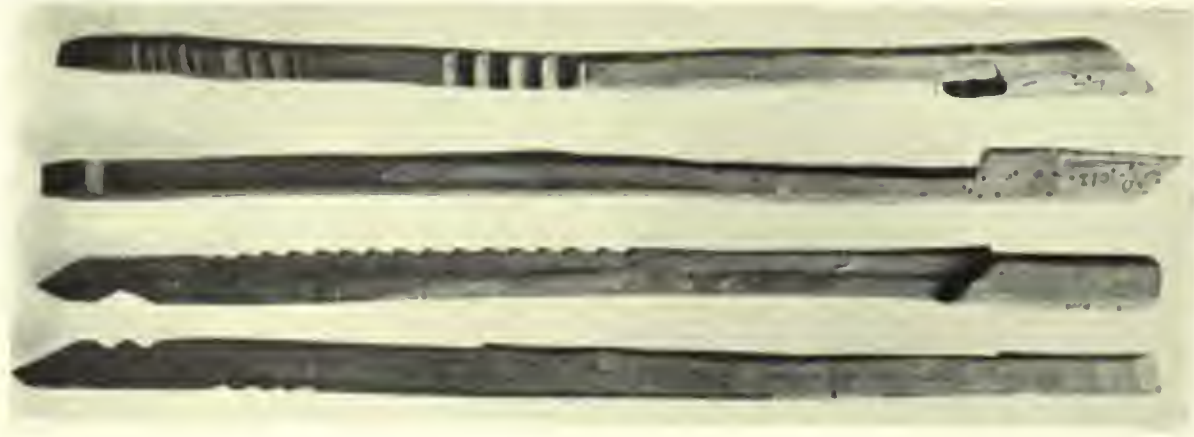


Fig. 1. Exchequer Tallies, eighteenth century. About $\frac{1}{4}$



Fig. 2. Exchequer Tallies, thirteenth century, and Private Tallies, fourteenth century. About $\frac{1}{4}$

early private tallies, other examples of which may be seen in the Record Office Museum, in the British Museum, and in various reproductions—for instance, the Letcombe examples in the Pipe Roll Society's introductory volume and those in Mr. Norman's article.

(1) Private tallies were popularized by the sheriffs, who collected small sums for the Exchequer, giving the debtor a tally which would acquit him at the Exchequer. The practice was treated of in the Statute of Rhuddlan (12 Edw. I) already mentioned.

(2) Whereas our examples of Exchequer tallies have all been stocks, it is more generally the foil of the private tally which has survived. This, of course, need not throw out the calculation of the notches.

(3) It is generally possible to make out the notches, but they are not always according to rule in the matter of size and seldom in that of position: it seems, however, from examples and from passages in records that it was not uncommon to write as well as cut the amount: there is an excellent instance on a fourteenth-century *de Banco* roll, where a tally produced in an action was inscribed with the amount as well as being *signalum per scocches*.¹ This, by the way, is one among many examples of the tally in legal proceedings.

(4) The obliquity of the transverse cut is frequently preserved, but very often only by sloping the cuts inwards, not by making it at an angle across the face of the tally as was done at the Exchequer. The writer can find no system in the cutting of the ends.

(5) We may distinguish roughly three varieties of private tally:

- (a) Very simple form on which is written *pro* followed by the name of the person to whose advantage record of the payment stands.
- (b) The tally *contra* X Y Z *de* such and such a sum with, perhaps, added particulars of the transaction.
- (c) The form which is inscribed *Tallia* X Y Z, the tally of so-and-so, *de* such and such a sum.

The second of these seems generally to have been used when there were, so to speak, three parties involved: the tally is against *B* of (*de*) certain moneys received from *C* for which *B* will have to account to *A*. Thus Letcombe belonged to the Abbot of Cluny: the Letcombe tallies acquit tenants there in the eyes of the abbot or his receiver as against the reeve who had collected the moneys: the form is therefore *contra prepositum* (against the reeve). Again, the British Museum tally *contra* Ralph de Spigurnel, constable of Dover Castle, concerning the ward—

¹ With this curious word compare the modern French *coche*, meaning the mark on a tally: it survives in *hop-sotch*.

i.e. the charge for repairing that castle—of Gravesend, would acquit the men of Gravesend at the Exchequer as against the constable.

The third form is again more simple: in the use above cited it would witness in favour of *A* that he had spent certain moneys upon *B*. For instance, of two private tallies in the Record Office Museum one reads: 'Horton. The tally of Thomas Symonds reeve there, of £14 *paid* to Stephen Velewet'; the other is *against* the reeve of Letcombe of money *received* by him of the farm and rent of [the term of] St. John.

(6) Finally, it must be remembered that the nearer a man was to official life the more his private tallies would be governed by the Exchequer rules.

Summing up, we may say that the form of private tallies varies indefinitely with circumstances: while these notes should have shown that the cutting of Exchequer tallies went by immutable rule from the twelfth century downwards.

XVII.—*On Italian Armour from Chalcis in the Ethnological Museum at Athens*, by CHARLES FFOULKES, Esq., based on photographs, notes, and measurements made by RAMSAY TRAQUAIR, Esq., A.R.I.B.A.

Read 2nd February, 1911.

FOR some years past a collection of helmets and portions of plate armour has been exhibited in the Ethnological Museum at Athens which, in spite of the exceptional interest which attaches to it, has up to the present time escaped the serious consideration of writers on the subject of the defensive armour of the Middle Ages. It is especially interesting because, from the time of the discovery of the collection to the present day, there has not been any attempt to restore or alter the condition in which the pieces were found, and when we consider the frequent mistakes made formerly, in other armouries, in this direction, this alone should recommend it to the study of those interested in mediaeval equipment.

It was discovered in the year 1840, during some alterations to the military hospital in the Castle of Chalcis in Euboea, thirteen miles from Thebes, and, according to the historian Buchon, who was present at its discovery, was bricked up in a casement (*un réduit*) which was brought to light by the falling down of a party wall. Hefner, in his *Trachten des christlichen Mittelalters* (vol. i, p. 83), gives a plate of very indifferent reproductions of some of the helmets, and states that they were found in a *cistern*. It seems quite unlikely, from the condition in which most of the pieces must have been when last used, that they should have been intentionally walled up shortly before the evacuation of the castle, for they would hardly have been worth the trouble of preserving. But it seems far more probable that they were thrown aside as needing repair or as past repairing. Hefner gives no authority for his statement that they were found in a cistern, and Buchon only mentions the fact of their discovery, and does not give a detailed description of the place in which they were found.

The armour was removed to Athens, where it was at first placed in the museum of the Acropolis, and, after some changes, was finally deposited in the Ethnological Museum.

Buchon's knowledge of armour seems to have been but vague, for on the existing labels, which are attributed to him, we find fourteenth-century bascinets and Venetian salades indiscriminately described as *Casques normands*, *Croisades du XII^e Siècle*.

In the notes on the discovery which Buchon gives in his *La Grèce et la Morée* (p. 134) he suggests that this collection formed part of the spoil from the battle of Lake Copais, where the chivalry of the Morea was defeated by the Catalan Grand Company in 1311. A mere glance at the armour, however, will show that this cannot have been the case, for there is little that could possibly be of so early a date.

The Castle of Chalcis was captured by the Turks from the Venetians in 1470, and it is the period from the middle of the fourteenth century to this date which exactly covers the style of helmets and armour of which the collection is composed. The sole exception to this is a morion, which is stated to have been part of the find. If this is really the case it is strange that there should be no examples of the change in armour between the mid-fifteenth and seventeenth centuries. Buchon does not mention the morion in the work above referred to, and it seems far more probable that it came from some other source, and has been included in the collection by accident.

There are at present sixty-three helmets in the collection, but the highest label number is ninety-five, and Buchon speaks of *une centaine*, so it is apparent that some specimens have been lost or disposed of.

Buchon mentions *Énormes Casques de Siège avec épaulières et leurs poitrails formés d'une seule pièce de fer. La visière seule est mobile. . . .* Either these helms are part of the lost specimens, or they are the bascinets, nos. 1, 2, 3, or 6, 7 on plate LII, which have no *poitrails* of a single piece of metal, and weigh only eight or nine pounds at the outside. He further states that a strong Maltese in his party could not wear one of them for more than ten minutes 'without grave discomfort'. Against this we must place the fact that the helmets are practically unlined, and that the Maltese had no body-armour to take the weight of the helmet from his shoulders, for a headpiece of eight pounds resting on the shoulders could not possibly cause discomfort in such a short time.

Besides the helmets there are two large cases full of pieces of body-armour, cuisses, knee-cops, jambs, gauntlets, and portions of breast- and back-plates. There is also a jazeran coat of plates, and a case full of arrow-heads and caltrops.

On the whole, the armour is in a fair state of preservation, though some of the helmets are partially destroyed by rust. There are no clues, heraldic or otherwise, as to the ownership of the armour, but some of the pieces bear armourers' stamps.

The chief interest lies in the helmets, which in some instances bear traces

of the original linings and coverings. Several are in good preservation, and have not been tampered with in any way. One of them has still the *vervelles* in place, but there is no chain-mail in the collection.

There are some good specimens of the great *bascinet* with collar and visor, which is more of the helm order than helmet, and of *salades* there is great variety. Two of these are of the ordinary German type, with long tailpieces, but the greater number are essentially of Italian make, evolved directly from the *bascinet*, and fitting more closely than does the German variety.

There are several Venetian *salades* in good condition, with the T-shaped opening for eyes and nose, a return to the form in favour in ancient Greece. The term '*barbute*' is often given to these helmets, or to the large *bascinet* with projecting cheek-plates. As a matter of fact, we are still uncertain as to the meaning of the word, except that it was a headpiece with some sort of chin protection; for Olivier de la Marche distinctly speaks of *la bavière de sa barbute*.¹ The word *barbute* was also used for a man-at-arms, as we learn from Du Cange. With regard to the word *bavière*, it is interesting to note that Buchon has transcribed the words *bachinet à bavière* as *bachinet à bannière* in his edition of St. Remy's description of Agincourt, which shows how careless he was as to the description of armour.

The body-armour seems to be mostly of mid-fourteenth-century to mid-fifteenth-century style, and, with the exception of one or two brass-bound pieces, is plain and unornamented. There are a few pieces slightly fluted in the Gothic fashion, which may be dated about the middle of the fifteenth century, but otherwise there is no elaborate embossing. There are no weapons in the collection except the arrow-heads before alluded to, and this suggests that if the hoard was known to the Turks they, being always more lightly armed than the Europeans, left the armour, but utilized any weapons that were found in the castle.

Buchon states that there were several pieces of armour for boys, but of this there is no evidence. Some arm- and leg-pieces are smaller than others, but all are for grown men, and he was probably misled by seeing separate jамbs and vambraces without the knee- and elbow-cops, which, when added, lengthened the defence.

An account of this collection by Buchon appeared in the *Courrier Grec* (*Tachydromos*), iv. 1841.

The following description of the illustrations embodies the notes and measurements made by Mr. Traquair, the numbers in brackets being those given on the museum labels.

¹ *Traicté des Tournois*, reprint Paris, 1878, pp. 80 5.

BASCINETS.

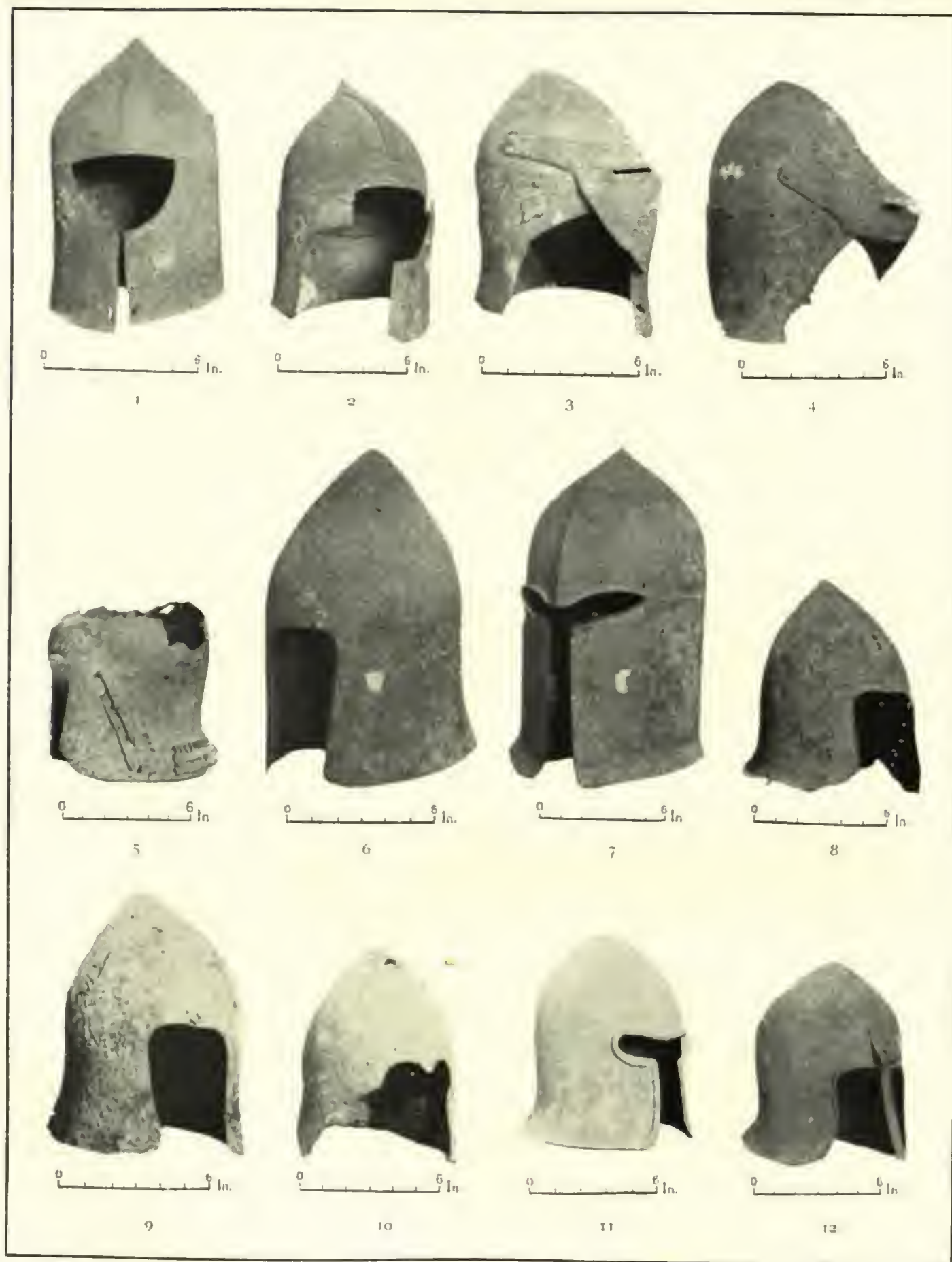
Plate LII, no. 1 (11). Visored bascinet of the latter half of the fourteenth century, 11 in. high by $6\frac{1}{2}$ diameter (28 by 17 cm.), weight 8 lb. 8 oz. (3.85 kilos). This helmet is almost cylindrical in shape, the lower edges bending slightly outward. The crown is embossed in four ridges, terminating in a point. It is formed of three plates: (1) The crown, riveted to (2) the neck and left cheek-piece at about eye level, and (3) the right cheek-piece hinged $1\frac{1}{2}$ in. below the lower edge of the crown. The right-hand plate has an oblong slot at the lower edge, which fits over a turning-pin on the left neck-plate. The visor is missing, but the bolts on which it moved are still in place.

No. 2 (12). A similar helmet with a narrow iron strip, fixed with brass rivets, crossing the crown from front to back, pointed at the apex. The right cheek-piece is missing, and the left cheek-piece is wider than that in no. 1, and is evidently meant to over- or under-lap the right. There is no turning-pin or slot on this plate, and it is impossible to say how the plates were held together, unless a strap was used, as is the case with some armets and burgonets of later date. The visor is missing in this example also. The weight and size are about the same as no. 1.

No. 3 (7). This is similar to the two preceding examples, and of about the same size and weight. The crown is pointed, but is forged smooth and not ridged. The left cheek-piece shows the turning-pin, as in no. 1, but the right cheek-piece is missing. The visor remains, and is pivoted on brass bolts. The vision-slits of the visor are turned slightly outward. The profile of the visor slopes rather sharply from the crown of the helmet outwards, and then drops almost perpendicularly to the neck.

No. 4 (84). In this example the left cheek-piece has been destroyed by rust, and the right neck-plate is also corroded. The right cheek-piece is missing, but the rivet-holes of the hinge which held it in place can be seen. The visor is different in form from that of no. 3. It projects farther, and is more of the 'snout-faced' type. The vision-slit is not divided as in no. 3, but is a single opening, and is strongly turned outward on the lower edge. The left side of the visor is deeper than the right, and is interesting as being an early example of the reinforcing of armour on the side most opposed to attack from the lance. The inside of the crown is strengthened by an iron plate supported by cross-straps of iron. As this example weighs 8 lb. 4 oz. (3.75 kilos) without the missing cheek-pieces, it must have been a heavy headpiece when complete.

There are altogether twelve of these bascinets in more or less the same condition as those described, none of the examples being perfect in every detail, but by comparison of the illustrations one with the other we can obtain a very correct idea of the perfect helmet.



PASCINETS AND SALADES IN THE ETHNOLOGICAL MUSEUM, ATHENS

Published by the Society of Antiquaries of London, 1911

No. 5 (86). This is a plain bascinet of rather earlier date than those already noticed. The crown has rusted away, but was most probably pointed, like those on many of the military brasses of the fourteenth century. The vervelles and attachment for the camail are still *in situ* on this example. The thin plate which covered the edge of the camail is perforated with trefoil decoration. In bascinets of this type the lines of the helmet generally fall rather sharply away from the face, following the slope of the vervelles and camail, but in the example before us the plates project well forward, which would seem to suggest that it was the immediate precursor of the collar of iron which is shown on the four preceding examples. The helmet is forged in one piece, and has a slightly downward drop over the nose.

Nos. 6, 8, 9, 10 (25, 31, 50, 47). These are plain bascinets of the ordinary type. From the position and number of the holes in nos. 9, 10 it is doubtful whether these examples were worn with a camail, and they suggest rather that they were intended for attaching the lining. In no. 8, of which part of the right side is rusted away, the line of large holes sloping sharply backwards on the left plate indicates that vervelles were part of the furniture of this helmet. These bascinets average 6 lb. 3 oz. (2.8 kilos) in weight, and some, of which no. 6 is an example, are about 14 in. high (35 cm.), from which it will be obvious that they rested on the shoulders.

The workmanship of the bascinets is unequal, and this may be accounted for by the supposition that repairs or additions were made, by the local armourers with the Venetian army at Chalcis, to helmets sent out from the workshops of more expert craftsmen in Italy. The crowns appear to be all skilfully forged, but some of the cheek-pieces and visors are rather more clumsy in make.

SALADES.

Nos. 7, 11 (77, 19). This type of helmet is usually known as the Venetian *salade*. By comparing it with the preceding examples it will be seen how it was directly evolved from the bascinet by bringing forward the cheek-pieces and lowering the forehead line till the face was completely protected with rigid plate without any hinge or pivot. The form is very similar to that of the Greek helmet with fixed visor. There is another example in the collection similar to no. 7. Both are forged in one piece, and have the lower edge of the back turned outwards, and the front edges strongly reinforced by a broad iron band fixed with brass rivets. These two examples are 11 in. (28 cm.) high and weigh about 6 lb. 10 oz. (3 kilos).

Of the same type as no. 11 there are altogether five examples, of which one only is perfect. They are all about 13½ in. high (35 cm.), and vary in weight from

6 lb. 1 oz. to 8 lb. 13 oz. (2.75 to 4 kilos), which is the weight of the example illustrated. The vision slits are slightly turned outwards, but the face-plates are flat edged. The shape of the helmets is cylindrical, with a slight outward bend at the base, and all have ridged crowns. They are made in two pieces—the crown, and the lower plate riveted over the lower edge of the crown at eye level.

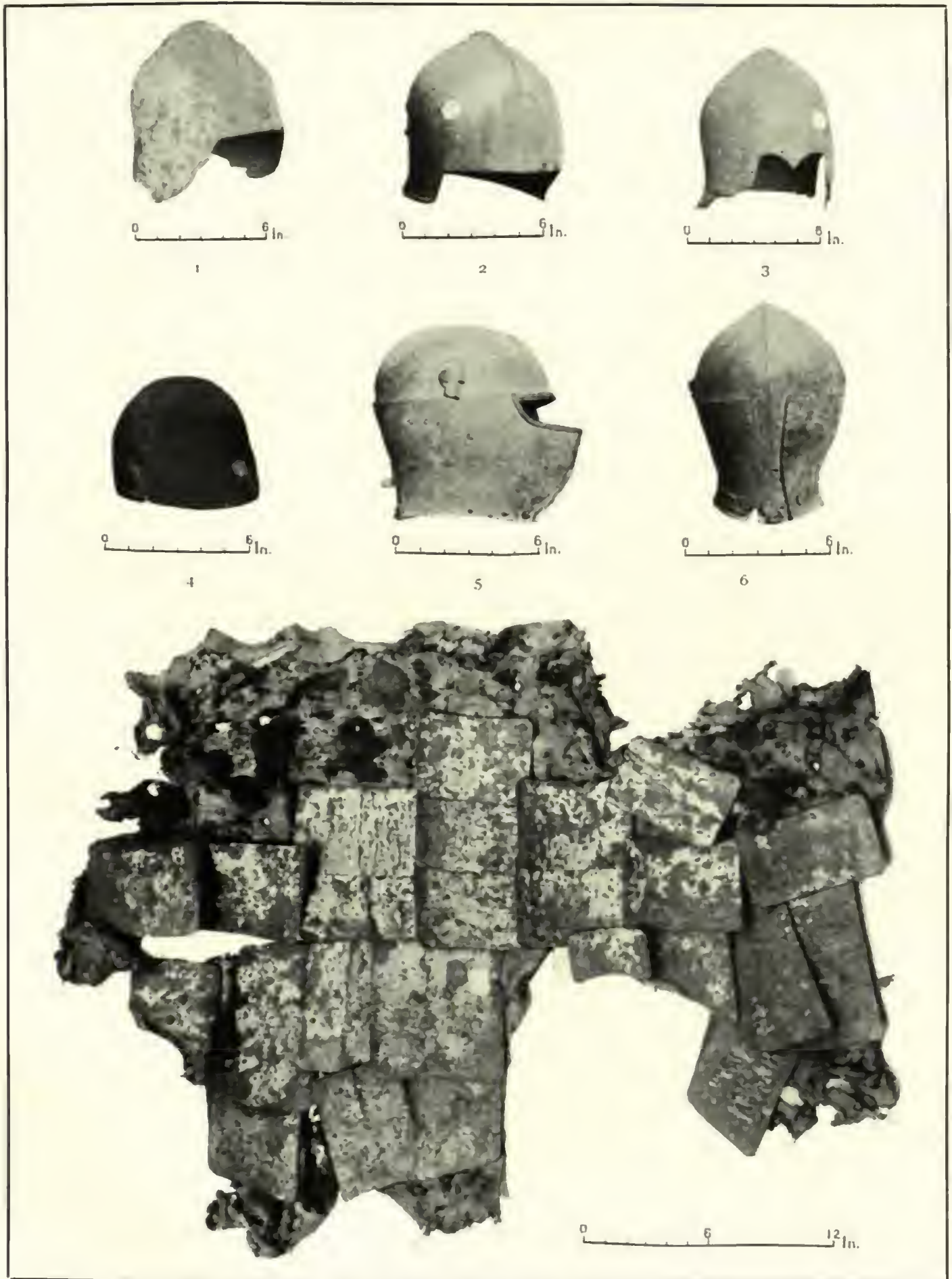
No. 12 (42). Of this type there are six examples, four of which are in bad condition. The shape so nearly approximates to that of the bascinet of the early fifteenth century, and also to that of the early *salade*, that it is difficult to say under which heading they should come. The example before us is the only one which still shows the nasal, though some of the others have the hinge for its attachment. A helmet of this type is shown in the picture of the Rout of San Romano (Nat. Gal. 583) by Ucello. A similar specimen (E. 1) in the Royal Armoury at Turin has spikes fixed on the outer side of the nasal, and has been catalogued by Angelucci as being of the thirteenth century.

Plate LIII, nos. 1, 2 (80, 60). A close-fitting *salade* with strongly marked ridged comb on the crown. No. 1 has a front reinforcing plate, scalloped on the upper edge, and ornamented round the face-opening with a row of brass studs. There are rivet-holes at the back, which seem too large for attaching the lining, and probably indicate that a tailpiece was fixed here. There are two more of this type, but without the ornamented plate. The example illustrated weighs 4 lb. 5 oz. (1.95 kilos).

No. 2 is another *salade* of somewhat the same shape, but the sides are cut away at right angles to the forehead line, and not curved as in no. 1. There are two large holes at the side, which suggest that a visor formed part of this piece. The back is ornamented with brass rivets, which, from their position, and from the fact that the lower edge of the *salade* is turned up and finished all round, do not appear to have fixed a tailpiece. Possibly the studs were to hold a covering of velvet or some other fabric, but there seems to be no trace of any material under the rivet-heads at the present day.

No. 3 (47) is another variety of *salade*. The crown is slightly ridged at the top, but becomes plain and smooth over the forehead, where the line drops sharply in a small nasal. The cheeks are cut away at each side on a curve, and the metal is cut out in a vertical slit about $2\frac{1}{2}$ in. high over each ear. The entire edge is pierced with holes for attaching the lining. The weight of this piece is 3 lb. 10 oz. (1.65 kilos), and there is a smaller specimen of the same type which weighs 2 lb. 5 oz. (1.05 kilos).

In pictures and miniatures of the fifteenth century helmets of this type are often shown with circular plates over the ears, which may possibly have been the case with this example, for it is hardly likely that the ears would have been left unprotected.



SALADES, ARMETS, AND JAZERAN COAT IN THE ETHNOLOGICAL MUSEUM, ATHENS

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There are six salades of the ordinary type with ridged crest, reinforcing plate over the forehead, and pivoted tailpiece. There is a hole in the centre of the ridge of each for fixing a plume or crest. The average weight is 2 lb. 5 oz. (1.05 kilos).

No. 4 (64) is the back view of a headpiece. There is no ridge or crest on this example, and it is all forged in one piece. Over the ears the metal is bossed out, a rather unusual contrivance necessitated by the close fit of the helmet. The series of holes at the back, rising in a line from the ears to the centre of the skull, may have been for attaching a lining or covering, or for fixing a tailpiece.

Baron de Cosson has described a similar helmet in the Duc de Dino's Collection, B. 15 (now in the Metropolitan Museum, New York, K. 50), which he considers to be of Spanish origin.

There are seven Turkish helmets of very thin metal, with high conical point terminating in a small tassel-shaped ornament. These helmets are generally forged in two pieces, the point being welded on to the body of the skull-piece. A row of holes is pierced two inches above the base line; in one specimen a link of mail still hangs. This can hardly have been the original use for these holes, as they are much too high for hanging the mail, unless vervelles were used, and of these there is no sign. Where Turkish helmets are fitted with a camail the rings are hung from the extreme lower edge. The average weight is about 1 lb. 12 oz. (0.80 kilos).

Nos. 5, 6 (82, 83). There are three armets in the collection, which may be dated between the years 1450 and 1480. They are made in five pieces: (1) the crown, continued backwards in a tailpiece to the nape of the neck; (2) a reinforcing piece over the temples, rising to a point in the centre, where it meets the ridged comb; (3, 4) two cheek-pieces hinged on the under-side to the crown; and (5) the visor, which is missing in all three examples. The hinge-plates to which the visor was pivoted are still in place on no. 5. The face-opening is strengthened by a strip of iron of square section round the edge of the skull and cheek-pieces. At the back of the neck is a square pin which held the circular disc which is found on armets of this date, the use of which was probably to protect the weak spot in the helmet, where the narrow neck or tailpiece meets the cheek-plates. The remains of a leather strap are seen on no. 6. To this strap was formerly hung the short camail which protected the juncture of the armet and gorget. The average height is 10 in. (25 cm.) and weight 9 lb. 10 oz. (3 kilos).

In all three examples there are large brass studs at intervals round the lower edge. Owing to the obvious weakness of this type of armet, in which the lack of a hook or catch renders the visor liable to be struck upwards, a beaver or *men-tonnière* was generally worn in addition, as may be seen in the battle-pieces of Paolo Ucello, but there appears to be no example of this piece of plate armour in the collection.

Armets of this date are rare in collections, and, where they exist, there is often a serious doubt as to their authenticity. In this instance, however, there can be no such question, as the date of the capture of the castle places them definitely before 1470. The same type seems to have been in use for a long period, for, as Viscount Dillon has pointed out, the armet which forms part of the Engraved Suit in the Tower, made by Seusenhofer (II, 5), is modelled on the same lines, though its date is forty-four years later than the specimens before us.

Plate LIV, nos 1-3 (145, 76, no number). These are breast- and back-plates which reinforced brigandines. No. 1, for the right breast, has the toothed

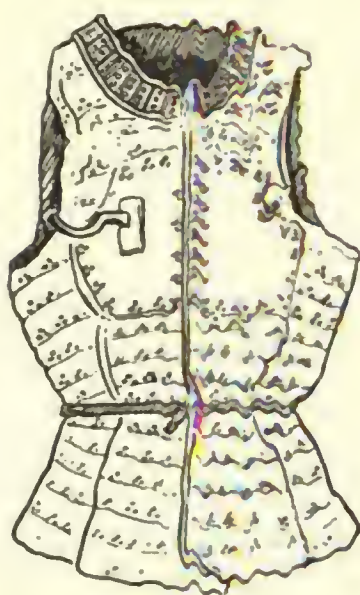


Fig. 1. Brigandine at Vienna.

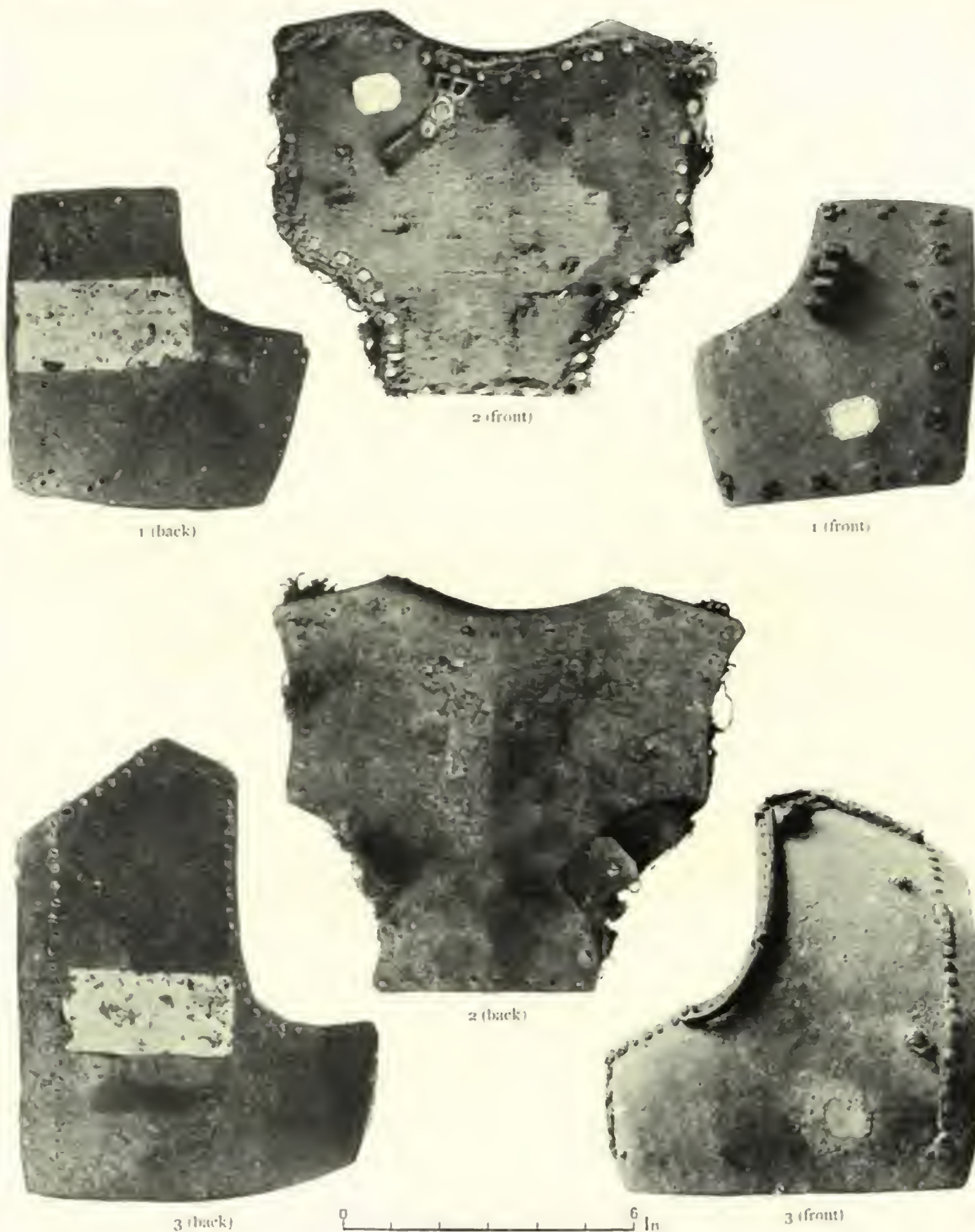
bracket to which the lance-rest was fixed. The teeth are bored vertically with square holes, through which the square-shanked pin was passed to hold the lance-rest in position. These plates are not common in armouries, and are very rare when in their original state on the brigandine. An almost perfect specimen exists in the Imperial Collection at Vienna (Saal xxv, no. 130), dated about 1500, a sketch of which will be found at fig. 1. The rivets set round the edge of the plate formerly attached a covering of fabric similar to that which covered the rest of the brigandine. At the back of this plate is an armourer's mark (fig. 2), repeated six times in pyramidal form. The letters are identical with those used by Antonio da Missaglia, who was working in Milan from 1451 to 1490. The known marks of Antonio are either surmounted by a knot or a cross with divided base (fig. 3), but the similarity of the form of the letters

is too striking to be passed over.

No. 3 is a similar piece of larger size, but without a lance-rest; it is also for the right breast, and still retains portions of the original covering of two thicknesses of fabric under the rivet-heads. A strip of iron is riveted on to the front edge of the arm-space. The mark in this piece is three rosettes (fig. 4), which at present it has been found impossible to trace elsewhere.

No. 2 is a back-piece, still covered with coarse canvas underneath and a finer material above woven with a diagonal diaper pattern. The fragments under the studs where the material has not faded are red and yellow. On the left side is part of a green canvas strap. There are no breast- and back-pieces of the ordinary type.

Plate LV, no. 1. A tapering iron plate 24 in. long (61 cm.) with a thin tang at the broad end, decorated with brass ornaments riveted on. Its use is unknown.



BRIGANDINE PLATES IN THE ETHNOLOGICAL MUSEUM, ATHENS

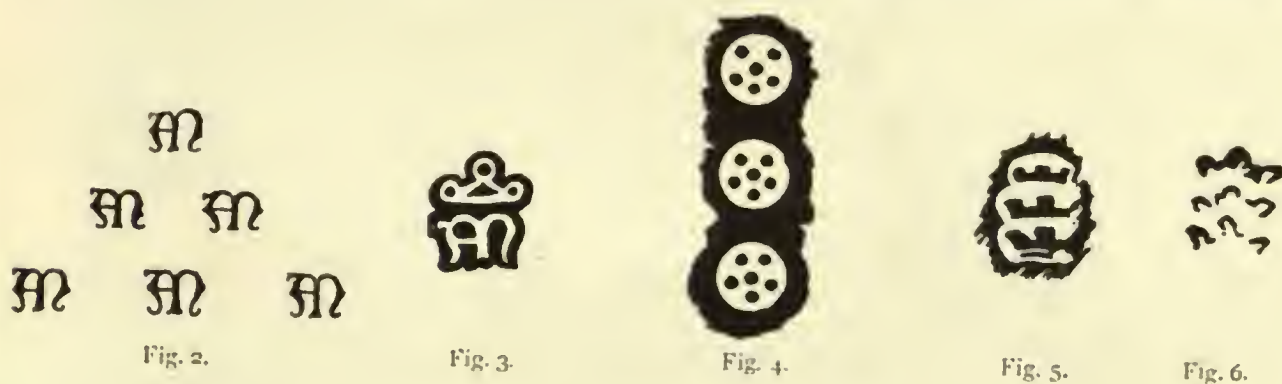
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It is bent at an acute angle, so a photograph was taken of the two portions separately.

No. 2. A brassard, of about the middle of the fifteenth century, in which the small elbow-guard is covered by a large spreading defence very similar to the reinforcing piece of the sixteenth century known as the pasguard. The vambrace in this example shows the original strap and buckle. Arm defences of this style are figured in the Beauchamp Pageants (MS. Cott. Julius, E. iv) and also on Mantegna's St. George in the Accademia, Venice.

There are a number of jambs, cuisses, and knee-cops of the same date. In one example a jamb has a turning-pin at the top, to which the knee-cop was



fixed, so that the lower defence could be quickly removed, an expedient which must have often been found necessary in forced marches or in fighting over difficult ground. The only piece worth illustrating is the portion of a cuisse shown on plate LV, no. 3, which has a hinged back-plate, showing that it was used by a man who fought on foot and never rode. The statuette of St. George at Dijon Cathedral shows half-plates hinged to the cuisse in a similar manner.

There is also part of a coat of jazeran armour (plate LIII), composed of overlapping plates varying in size from 5 by 3½ to 7 by 3 in. (13 by 4 to 18 by 8 cm.). The upper part is formed of plates sewn horizontally on a double thickness of coarse canvas, while on the lower portion the plates are sewn upright. The lower part is cut away in two semicircular openings at back and front for convenience on horseback, the long side strips protecting the thighs, as was the case with the Norman hauberk. It is probably of oriental origin.

Of the other armourers' marks illustrated (figs. 5-10), which are found on plates similar to those on plate LIV, none resemble any known stamps except fig. 5, which seems to be the same as an unidentified mark on a *salade* at Madrid (D. 14), figured on fig. 6.

It is to be hoped that the museum authorities at Athens will catalogue the whole collection under proper headings, even if Buchon's labels are retained

from sentimental interest. It may be that further examination may bring to light other interesting details which will help to identify some of the individuals who garrisoned the castle. Such stores of armour found in one place, and left untouched by the restorer's hand, are rare, and are of the greatest use in the study of defensive armour.

In conclusion, I must express my indebtedness to Mr. Ramsay Traquair and Mr. H. H. Jewell for photographs and minute notes and measurements of the armour and helmets, made for the Byzantine Research and Publication Fund, to Mr. F. W. Hasbick, Assistant Director of the British School at Athens, and to Dr. Rado, Director of the Ethnological Museum, Athens.

For various reasons it has been found practically impossible to bring all the photographs down to the same scale, so a separate scale is given in each case.



Fig. 7.

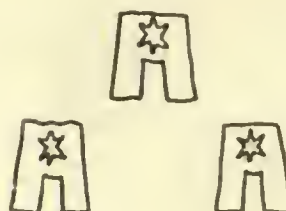


Fig. 8.

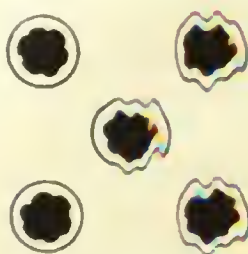
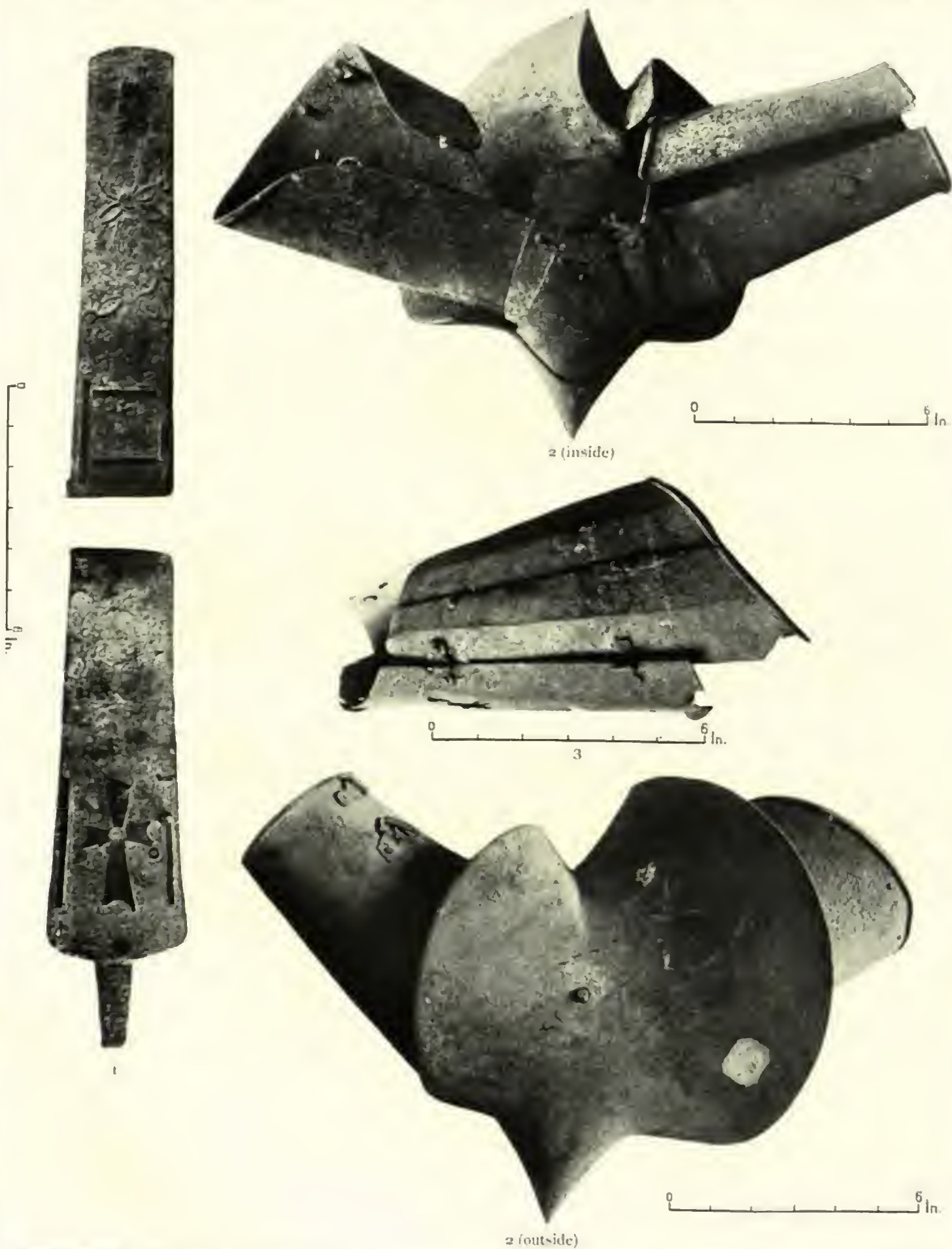


Fig. 9.



Fig. 10.



BRASSARD, CUISSE, ETC., IN THE ETHNOLOGICAL MUSEUM, ATHENS

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XVIII.—*Mediaeval personal ornaments from Chalcis in the British and Ashmolean Museums.* By O. M. DALTON, Esq., M.A., F.S.A.

Read 2nd February, 1911.

THE publication of the Italian armour from the Castle of Chalcis recalls the existence of other antiquities of similar date and origin discovered in the same place, and now preserved in the British and Ashmolean Museums.¹ While the objects described by Mr. Foulkes are all military, those with which we are here concerned were made for civil uses. They are personal ornaments, and illustrate in a pleasing fashion the knightly civilization² in Greece during the Venetian supremacy in Euboea.

It is not necessary to enter at length into the history of Euboea from the time when the Fourth Crusade brought Greece under the dominion of Frankish barons: the story has been told in detail by Professor Bury.³ Here it need only be said that the two hundred and sixty-five years between the Crusade and the capture of Negroponte (Chalcis) by the Turks in A.D. 1470 has been conveniently divided into three periods. In the first of these, from A.D. 1205 to A.D. 1262, the Lombards held the island under the overlordship of the Princes of Achaia. During the second, A.D. 1262—A.D. 1385, Venetian influence, already exerted through the *baili* of the Republic, increased in proportion as the Achaian suzerainty became weak and nominal. The third period, A.D. 1385—A.D. 1470,

¹ The circumstances of the discovery of these objects do not appear to be accurately recorded. They were purchased by the late Sir A. W. Franks and the late Mr. C. Drury Fortnum after the middle of last century as parts of a find made not long before at Chalcis.

² 'Frankish' civilization; the word is used in its later sense to indicate Western as opposed to Byzantine culture.

³ *The Lombards and Venetians in Euboea*, in the *Journal of Hellenic Studies*, vii, pp. 309 ff.; viii, pp. 194 ff.; ix, pp. 91 ff. See also Sir Rennell Rodd, *The Princes of Achaia*, and W. Miller, *The Latins in the Levant*, in which books bibliographies of works in other languages will be found.

witnessed the undisputed domination of Venice. It is to the last of these periods that the objects now to be described apparently belong; they are for the most part contemporary with the armour; and though local or oriental influences may be here and there observed, the workmanship bears the impress of North Italian art at the time when the courts of Northern Italy lived under a feudal civilization similar to that of France and the north-west of Europe. They are of one age and one culture with the familiar caskets, enriched with intarsia and carvings in bone, on which we see depicted by Italian hands the stories of mediaeval romance.¹

The ornaments in question comprise gold and silver finger-rings and earrings; plaques and rosettes of silver-gilt once applied to garments; buckles, tags, and hooks from girdles; and small globular or hemispherical buttons of the most varied description. Since the find, as represented in England, is now divided into two parts, one in London, the other at Oxford, we may conveniently consider each of these in its turn, beginning with that in the Fortnum Bequest in the Ashmolean Museum, as the more homogeneous of the two. It comprises a series of twenty-one finger-rings, all acquired together, and a single large circular disc or button obtained upon a different occasion. These objects may now be shortly described under the numbers which they bear in Mr. Fortnum's Catalogue, and in the order in which they are arranged, illustrations being added in the case of the more important examples. All the rings are of gold except where it is otherwise stated.

No. 376. Plain ring with angular shoulders: the bezel has a large pearl revolving on a pin (fig. 1 *a*).

No. 377. The hoop with four projections at equal intervals; between these bands of quatrefoils and lozenges reserved on a ground of niello. Bezel a raised setting containing a crystal of diamond (fig. 1 *b*).

No. 378. Flat hoop terminating in lions' heads; polygonal bezel containing a crystal of pyrites (fig. 1 *c*).

No. 379. Flat hoop enriched with niello and shaped at the shoulders, which end in monsters' heads. High bezel with a long pin on which revolves a collar with four large pearls; above are a large cylindrical pearl and another pearl of smaller size (fig. 1 *d*).

No. 380. The hoop wreathed with corded ribs, between which are panels with scrolls reserved upon a nielloed ground. The bezel, which rises from two volutes, has two collars revolving upon a pin, each set with four pearls. At the end of the pin another pearl (fig. 2 *a*).

¹ J. von Schlosser in *Jahrbuch der kunsthistorischen Sammlungen des allerhöchsten Kaiserhauses*, xx, pp. 220 ff. (Vienna, 1899); see also other references given in the British Museum *Catalogue of Ivory Carvings of the Christian Era*, no. 400, p. 137.

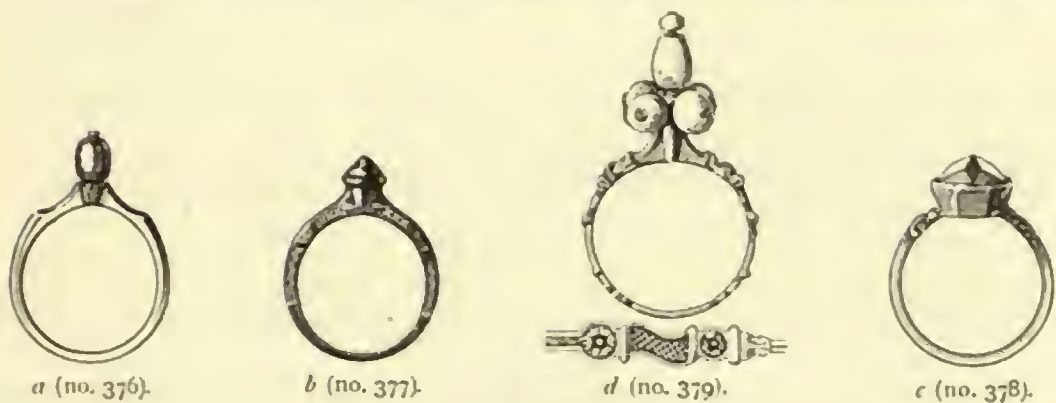


Fig. 1.



Fig. 2.

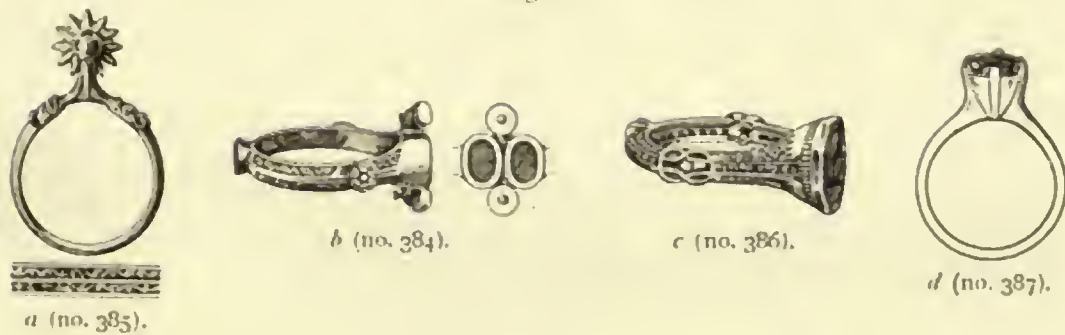


Fig. 3.

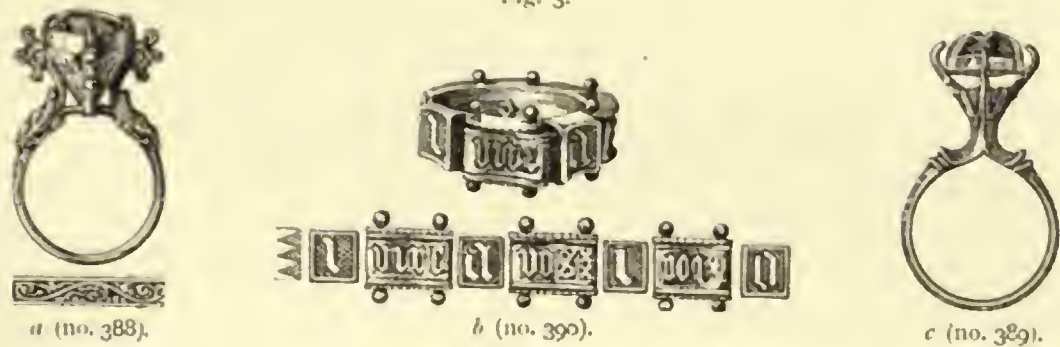


Fig. 4.

No. 381. The hoop has a continuous scroll reserved upon a ground of niello, and terminates at the shoulders in monsters' heads. High bezel, formed of four crockets at right angles to a central baluster, surmounted by five pearls fixed on pins (fig. 2 *b*).

No. 382. The hoop a twist of gold and cable silver wire; the bezel a flat plate, to which five pearls are fixed on pins (fig. 2 *c*).

No. 390. Hollow hoop, which has eight pellets projecting from each rim; it is formed of alternating large and small panels, with legend in black letter reserved on a ground keyed for niello (?). On the larger panels the words *vire vos voi*; on the smaller the letters *a, l, a, l*(?). The ends of letters are foliated in a style usual in the first half of the fifteenth century (fig. 4 *b*).

No. 384. The hoop with three rosettes in relief, between which it is enriched with niello. Bezel formed of two oval settings containing garnets; between them, on each side, a pearl fixed on a pin (fig. 3 *b*).

No. 385. Hoop of triangular section, with a median rib, on either side of which are scrolls reserved upon a ground of niello; it ends in monsters' heads, from which rises a high bezel in the form of a spur with revolving rowel (fig. 3 *a*).

No. 386. Pierced hoop, with three knots at equal intervals; between these a median band of pellets divide two bands of quatrefoils reserved upon a ground once enamelled in green and white. Octagonal bezel set with a sapphire (fig. 3 *c*).

No. 388. Hoop resembling that of no. 381; the bezel also has similar volutes, but instead of a baluster these enclose a pyramidal setting with four claws containing a ruby, and ornamented on the sides with four nielloed flowers (fig. 4 *a*).

No. 389. On the outer side of the hoop the legend, in Lombardic character, reserved upon a ground of niello: *Verbum caro factum est et (habitavit in nobis)*, John i. 14. Cf. no. 391 and fig. 17 *a*. High bezel with four claws, containing an amethyst engraved in intaglio with a figure of Abundantia. The gem is antique (fig. 4 *c*).

No. 387. Slender hoop; pyramidal bezel with claws, containing an amethyst (fig. 3 *d*).

No. 383. Hoop of triangular section with Greek inscriptions reserved upon a nielloed ground; on each shoulder an oval raised setting with a ruby. The ends of the hoop, suggesting debased monsters' heads, support a gold quatrefoiled plate, with four holes for pins on which were fixed pearls now lost. Cf. no. 382 (fig. 2 *c*).

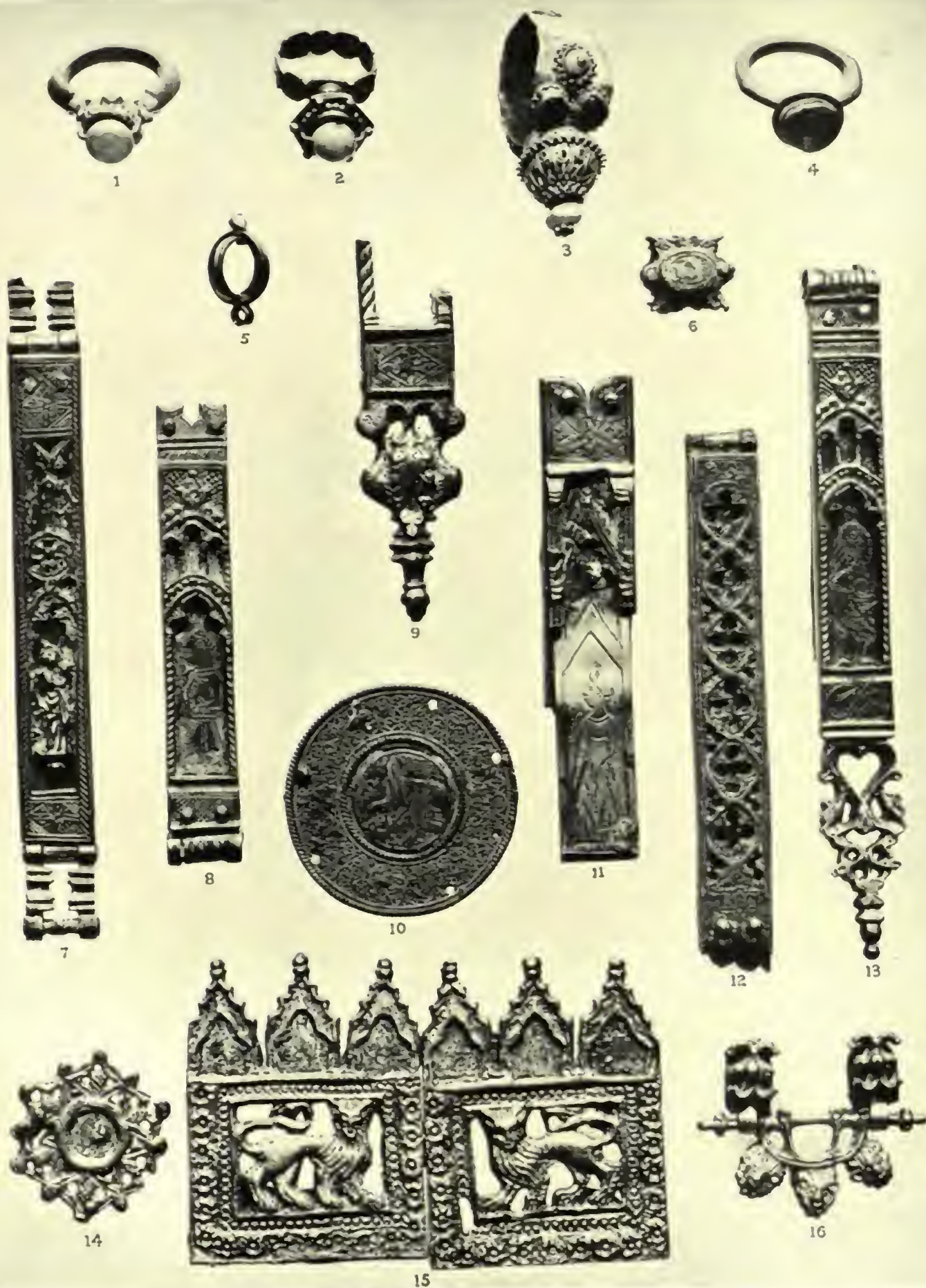
For the inscription, which begins ΕΚ ΓΗC Ο ΧΡΗCΟC, &c., see p. 401 below, and cf. no. 396.

No. 391. The outer side of the hoop nielloed with the same legend as no. 389; on each shoulder a leaf-shaped panel with scrolls, continued on the ends of the bezel. Oval bezel set with a plasma with an antique intaglio of Ceres (fig. 5 *a*).

(Similar leaves occur upon the shoulders of Italian rings in the Franks Bequest in the British Museum. Cf. also a ring in the Pichon Collection, *Catalogue*, no. 67.)

No. 392. Bronze gilt signet; octagonal bezel rudely engraved with a lion rampant; on each shoulder of the hoop is chased a leaf (fig. 5 *b*).

No. 393. Signet; octagonal bezel engraved with a shield of arms: a cinquefoil; above, helmet and crest, a demi-eagle displayed. The hoop has on each shoulder a lion(?) on a nielloed ground: the back much worn (fig. 5 *c*).



MEDIAEVAL PERSONAL ORNAMENTS FROM CHALCIS

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No. 394. Silver signet; at the back of the hoop a small pointed-oval panel in relief; on each shoulder is chased a lion, with scroll-work. Circular bezel engraved with a lion sejant and an indeterminate legend in Lombardic letters (fig. 5 *d*).

(A somewhat similar gold ring of about the same date, found in Cyprus, is in the Franks Bequest in the British Museum, *Catalogue of Mediaeval Finger-rings*, no. 250.)

No. 395. Signet; on each shoulder a leaf chased and engraved. Octagonal bezel engraved with a lion rampant within a bordure of sixteen stars (fig. 6 *a*).

No. 396. Hollow hoop, nielloed and enriched with scrolls enclosing three oval panels, that at the back much worn, those on the shoulders bearing a dragon(?) and a lion(?). Circular bezel, with a conventional two-headed eagle in relief, scrolls taking the place of the heads; round the device and round the outer edge of the bezel, Greek legends partly corresponding with those of no. 383, for which see below (p. 401). Much of the niello lost (fig. 6 *b*).

No. 103. Gold disc or button. A circular plate with a garnet in a raised setting in the middle. This is the centre of a cross formed of eight pearls on pins, with four other pearls between the arms. The ground is ornamented with filigree scrolls in plain wire (fig. 6 *c*).

The above ornaments form a remarkably interesting series of mediaeval rings, and when the contemporary Italian rings in the British Museum collection are published, considerable material will be available for comparative study.

The objects in the British Museum are more varied in material, form, and destination. They include four gold rings.

The hoop ending at the shoulders in conventional monsters' heads; high bezel in the form of a calyx of six petals, with a pearled edge. It is set with a pearl pierced by a wire. Weight 230 grs. (plate LVI, fig. 1; and fig. 7).

Polygonal hoop; bezel in form of a calyx, with a raised setting containing a sapphire. Weight 198 grs. (plate LVI, fig. 4).

Flat hoop engraved to represent a cable; high calyx-bezel supporting a hexagonal plate with six pellets and a circular setting containing a pearl pierced by a pin. Weight 125 grs. (plate LVI, fig. 2).

The hoop a broad thin band ornamented with gems and pearls, in raised settings surrounded by pellets: on each shoulder, a pearl and two garnets (one of the latter missing); at the back a garnet. The bezel is a globe of filigree with two zones of pellets, and a pearl revolving on a pin. Weight 205 grs. (plate LVI, fig. 3).

These rings are more massive and less highly finished than those at Oxford. Their relationship to the contemporary goldsmith's work of Italy is less close, and, for want of comparative material, it is not easy to trace their true affinities. The type of bezel in the form of an open calyx occurring in three examples is, if

not unknown, at any rate very rare among Italian and Byzantine rings. The somewhat florid treatment of the last example may point to a Levantine or Adriatic art; while the pierced filigree of its globular bezel, similar to that of Moorish jewellery from Spain, may perhaps be traced to a similar descent. The heavier treatment of all four rings suggests an origin in workshops further removed from immediate Italian influence. Such an origin might explain their rather earlier appearance; though it is possible that they are really somewhat older than the rings at Oxford. The presence of common features, such as the monsters' heads and the pearls fixed on pins in a similar way, seems to bring the two groups into connexion.

The ear-rings of the find are of some interest in view of the comparative rarity with which mediaeval ear-rings are found. They are small and U-shaped, enriched on the outer side with floral scrolls on a ground of niello; in the single perfect example (fig. 8) the loop is secured by a pin with a large pearl at each end. Associated with the above in the Franks Bequest were three gold ear-rings with large hooks and pendants, which may possibly represent a local survival of an antique form. A pair has emeralds in conical settings, and on each ring a single pendant terminating in two pearls and a gold bead; a third has an emerald in a square setting, with a quatrefoil in *champlevé* enamel at the back: it originally had three pendants ending in pearls, one of which is lost. Perhaps it is more probable that these ornaments are late-antique, and intrusive in the treasure, than local survivals of Roman forms in the advanced Middle Ages.¹ But the second alternative is not excluded.

The majority of the remaining objects, which are of silver, for the most part gilt, were apparently fixed to leather belts or girdles of woven fabric. Two are hooks, perhaps intended to support knives, daggers, or small articles; one (fig. 9) represents a crowned figure holding a fleur-de-lys in each hand, the other a monster's head and neck (fig. 10). The destination of the ornament with lion masks on a bar (plate LVI, fig. 16), and of the oak-wreath with acorns (fig. 11), is not obvious, though the former may be the end of a belt; but a number of *plaques d'applique* of various size and form represent, with the buckles and mordants, what was known as the *ferrure* or garniture of the girdle.²

¹ For the type see F. H. Marshall, *Catalogue of Jewellery* (British Museum, 1911), pl. LIII-LV.

² The garniture consisted of the buckle and mordant, and a number of plaques, rosettes, *clous*, bars, &c., which might be of great variety in form, and pierced, enamelled, or enriched with precious stones. An account of A. D. 1351 has an item: *pour faire et forgier la ferrure d'une ceinture d'or sur un tissu azuré dont les cloux sont de dauphins et de liz, à une grenature ronde enverrée d'esmail* (*Compte royal d'Étienne de la Fontaine*, f. 8). See Victor Gay, *Glossaire archéologique*: s. vv. *ceinture*, *clou*.

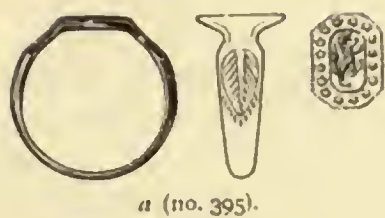
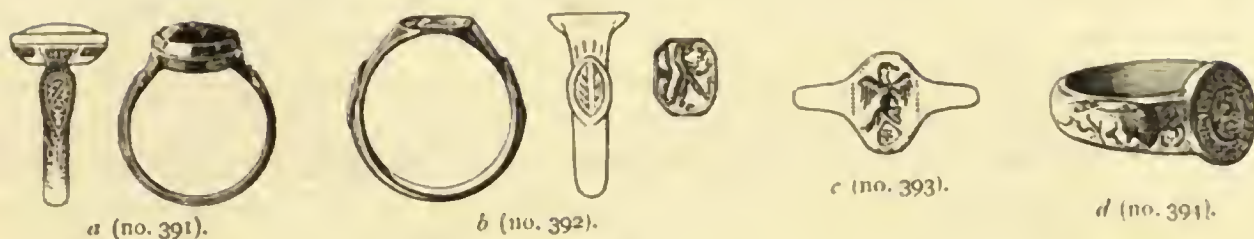
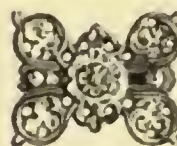
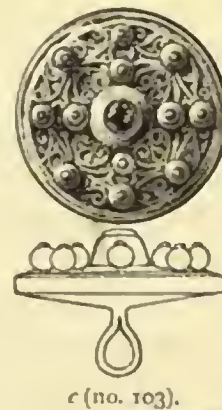


Fig. 6.



One, a member of a considerable series, has a fine pierced foliate design (fig. 12). Other pierced ornaments perhaps represent the *clous* of the garniture (plate LVI, fig. 14); and to the same category more diminutive ornaments may belong (plate LVI, fig. 6). The larger tags and mounts are composed of two inner plates engraved with subjects and framed in Gothic canopies and tracery (plate LVI, figs. 8, 11, 13, and fig. 13): in two cases they have figures in relief (plate LVI, fig. 7). Three finials are preserved: one is well conceived; in one, confronted birds uniting with foliage to produce a symmetrical design (plate LVI, fig. 9). There are four broader buckles of different patterns, one with a male head in relief, another with delicately pounced scrolls on double plates at the back, between which are still remains of leather or textile fabric. Two pierced plaques from the front of a belt (plate LVI, fig. 15) have lions in borders of rosettes, confronted when the girdle was fastened, and at the top three canopies, perhaps once enamelled. On the ground of one of these is incised a letter H (?): traces of further letters are seen in others.

Turning to objects still enriched with enamel, we note in the first place a plaque evidently intended to be mounted on a strap (fig. 14). It is a rhomboidal panel, having, below, an applied twist, and, along the top, a Gothic cresting. It bears an inscription in black enamel on a scroll terminating in finials resembling pomegranates, the ground having finely pounced scroll-work. The sense of the legend, which is in black letter, is at present obscure, though the letters themselves are mostly clear—

ellmod(?)o*ospo(?).

On the back is a sunk panel with a hatched background on which the letters of a monogram or cipher, connected by links of fine chain, are reserved in the metal. Three other plaques have inscriptions reserved in the metal on a ground once filled with enamel; on one is the word **Clara b¹** in black letter; on the other, now broken into two pieces, are the letters **sa|aba** in Lombardic; the third, which is fragmentary, has Hebrew characters (see below). We may specially note the occurrence, side by side, of the two mediaeval European scripts, Lombardic and black letter. The former is the character habitually employed in Italy, the latter being more seldom found. It may be noted, however, as occurring on more than one Italian ring in the British Museum, especially on an example in the Waddesdon Bequest, which bears the text *Verbum caro factum est*, as already recorded upon a Chalcis ring at Oxford (no. 389 above).

¹ Possibly *Clara bella*, as on the maiolica dishes of the fifteenth and sixteenth centuries.

In a series of diminutive quatrefoil plaques a shield of champlevé enamel is surrounded by foliate ornament (fig. 15). On the shield a heron-like bird stands upon a green base, the rest of the ground being red; the bird may be heraldic, borne as the arms of some Venetian family such as Cicogna.¹ These little quatrefoils, like the example in the figure, were all originally set in rectangular gilt plaques with studs at the back for fixing to leather or woven stuffs;² but most have lost their settings. A yet smaller rectangular plaque with a shield bearing a large rose, and a thin fragment with a bendy shield, were probably also enriched with enamel, though no traces remain. A few small shield-shaped and rectangular plaques with various foliate designs retain more or less of their enamel, which is of a dark green colour.

A set of shaped plaques (fig. 16) and one or two smaller pieces illustrate the work known as filigree enamel, in which wire encloses the design in the same way as the strips of metal in the cloisonné process. This kind of enamelling is supposed to have originated in or near Venice in the second half of the fourteenth century: it soon spread into Hungary and Eastern Germany, and is perhaps best known to us from the ornament of fifteenth-century Hungarian chalices.³ Its appearance upon this Chalcis metal-work is natural in view of the political and commercial relations between Venice and Euboea, to which allusion has already been made. A medallion, with a fine filigree border, has an enamelled disc with a large water-bird (plate LVI, fig. 10). This was also applied to a belt or garment.

There are a great number of small buttons of different design, many

¹ Buchon, *Nouvelles recherches historiques sur la principauté française de Morée*, &c. (1843), Atlas, pl. xl, fig. 13, reproduces a shield of arms with a similar bird, seen above 'la porte de Chalcis sur l'Euripe', where it was surmounted by the lion of St. Mark. The enamels are possibly connected with the same Venetian family.

² Remains of a fabric inwoven with gold thread appear at the back of several of the enamelled plaques. We may recall the fact that the girdle was often of silk, to which the metal was riveted. In the accounts of the Dukes of Burgundy for the year 1367 we read of money paid to one H. Orlant: *pour faire asseoir sur un tissu tout neuf la ceinture d'argent dorée à aigles de Mgr., et pour yelle toute dorer et river sur ledit tissu, et pour un tissu de soie, pesant 7 onces, pour usseoir ladite ceinture* (B. Prost, *Inventaires mobiliers . . . des Ducs de Bourgogne*, no. 665). Cf. *ibid.*, no. 2024: *pour 5 onces 3 quars de soye perse, pour faire un tissu de ceinture pour cloer d'or*. Girdles belonging to Henry V of England are described as of silk, *soy noier, tissu pourpre*, &c.; one has *les tissus overtz de hauteice* (*Rotuli Parliamentorum*, iv. 218, 219, &c.).

³ J. Hampel, *Das mittelalterliche Drahtemail*, 1888; E. de Radisics, in *Gazette des Beaux-Arts*, 3rd Period, xxiv, p. 276; Pulszky, Radisics, and Molinier, *Chefs-d'œuvre d'orfèvrerie à l'Exposition de Budapest*, 1884; *Zeitschrift für christliche Kunst*, vii, 1894, p. 139. The British Museum possesses other appliqué plaques with this enamel on a North-Italian girdle ornamented in addition with niello-work of the fifteenth century. This girdle also formed part of the Franks Bequest.

globular, in filigree-work recalling the bezel of one of the rings; others hemispherical, and ornamented on the flat side. A set of buttons, each formed of two circles intersecting at right angles and terminating in a pearl, deserves especial notice (plate LVI, fig. 5). All these buttons were probably sewn in close rows upon the garments, after the fashion illustrated in the secular art of the late fourteenth century.

Some of the legends and inscriptions on the rings and other objects are clear, such as the word *Clara*, already noticed, and the text on nos. 389, 391 of the Oxford series, commonly found on Italian rings of the fourteenth and fifteenth centuries: *Verbum caro factum est et [habuit in nobis]* (John i. 14) (fig. 17*a*). It occurs on several contemporary Italian rings in the British

ⲕⲟⲩⲁⲣⲉⲃⲱⲛⲓⲟⲁⲣⲟⲩⲁⲛⲟⲩⲙⲟⲩⲉⲥⲙⲁⲛⲓ

a

Ⲭⲉⲕⲛⲥⲟⲭⲣⲏⲥⲉⲕⲭⲟⲟⲥⲧⲟⲥⲁⲣⲕⲓ
ⲟⲟⲩⲁⲣⲉⲃⲱⲛⲓⲟⲁⲣⲟⲩⲁⲛⲟⲩⲙⲟⲩⲉⲥⲙⲁⲛⲓ

b

ⲭⲟⲥⲧⲉⲧⲟⲕⲟⲥⲙⲟⲕⲉⲣⲁⲧⲟⲧⲉⲧⲟⲧⲁⲫⲟⲛⲕⲓⲥ
Ⲭⲉⲕⲛⲥⲟⲭⲣⲏⲥⲉⲕⲭⲟⲟⲥⲧⲟⲥⲣⲕⲏⲟⲛⲟⲩⲙⲟⲩⲉⲥⲙⲁⲛⲓ

c

Fig. 17.

Museum, and was probably regarded as a charm. In other cases the legends offer great difficulty, even where the letters are wholly or for the most part clear. That of the plaque (fig. 14) is not obvious; nor is the inscription on the broken plaque clear (p. 398). The Oxford ring (no. 390) with *vire vos voi* and *alol* is equally obscure: no. 394 is, to me at least, illegible.¹ The Hebrew letters on the fragments mentioned above read ארטיני and נרשיו. Dr. Barnett informs me that they make no sense: he suggests that they may be translitera-

¹ It is not necessary to assume that all inscriptions on Italian jewellery are in Italian: French mottoes were used, e.g. *Loiate passe tout*, *A bon droyt*, and *Plus ault* in the Visconti inventory quoted below.

tions of Italian names, like those of English names in Persian and Hindustani characters upon the gems of signets in the East. The same difficulty arises in the case of the Greek legends on two rings (383 and 396) at Oxford. In each case we have a metrical line: ΕΚ ΓΗΣ Ο ΧΡΥΣΟΣ ΕΚ ΧΘΟΣ ΤΟ ΣΑΡΚΙ(ΟΝ), with the variants ΧΡΗΣΟΣ and ΣΑΡΚΗΟΝ, which, as Dr. P. Maas of Berlin has suggested, may be a Byzantine motto or proverb, though at present he has been unable to trace it in any collection of such sayings. No. 383 has another line, or line and a half, which I am as yet unable to read: ΟΟΛΦΟΗΛΕΠ(Μ ?)ΙΛΟΣΕΚΛΕΠΙΛΟΥΤΙΝΧΑ (fig. 17*b*). On no. 396 the following letters are continuous with ΣΑΡΚΗΟΝ—ΑΜΦΟΔΥ(?)ΕΠΛΕΚΑ, while the legend round the bezel appears to run: + ΟΣΓ(?)ΕΤΟΚΟΣΜΟΚΕΡΑ ΤΟΤΕ ΤΟΤΑΦΟΗΚΙΣ (fig. 17*c*). Scholars familiar with the pronunciation of modern Greek and the corruptions introduced in the Middle Ages may find the clue to the enigma.

The art represented by these objects from Chalcis is mainly Italian and Venetian. But, as we might expect in a Greek dependency of Venice, there are oriental affinities due rather to local influence than to that of Constantinople. Greek or Levantine or Adriatic, the style which this influence represents is more florid than that of Italy; to it we may perhaps ascribe the sometimes fantastic use of pearls and the predilection for globes or spheres of filigree manifested in many of the buttons and in one of the rings (plate LVI, fig. 3). To Byzantine influence, direct or indirect, may be ascribed the two-headed eagle of the Oxford ring (no. 396) and the Greek inscriptions. Though Greek legends upon jewellery might well occur in the Venice of the fourteenth or fifteenth century, it is perhaps more likely that in the present case they were adopted by Italian goldsmiths established in Greece; the rings on which they occur might indeed be described as products of a colonial art. The British Museum has several rings of Italian type with Greek legends on the hoop or bezel: one has a verse from the Psalms (Ps. xxvii. 1); another a typical Byzantine cruciform monogram.¹ The interaction of Eastern and Italian influence is marked in the ring with name and arms of Zeno Donati found in the Morea, and of about the same date as the Chalcis find. Here the form is that of the oriental bow-ring as used down to modern times in Persia and Hindostan.

The features which are definitely Western and Italian are more numerous and distinctive. The various plaques, as we have seen, are almost all decorated in a Gothic style, such as we find prevalent in Northern Italy during the later fourteenth century. The two processes of enamel which occur—champlevé

¹ British Museum, *Catalogue of Early Christian and Byzantine Antiquities*, no. 171.

and filigree—are both Western, and the latter, as already noticed, distinctively Venetian; the Byzantine cloisonné process is not used. The general appearance of all the finer rings is characteristically Italian: they can be matched by examples which have no connexion with Greece. The octagonal bezels of two signets (nos. 393 and 395) are also Italian forms; and the heraldry is Italian, the ‘double-headed’ eagle of fig. 396 forming the single exception. The setting of gems in claws may be regarded as a Western rather than an Eastern method, and minor features, such as projecting rosettes on the hoops, or raised leaf-shaped panels on the shoulders, are equally characteristic. Other features, however, may be regarded as common to the Italian and Byzantine art of the period. Such is the use of niello, though in the present case the Italian origin can hardly be doubted. The termination of hoops in monsters’ heads is also neutral: it comes down from antique art, and was thus indifferently employed in East and West: it is, however, more frequent in the West, and may with some confidence be assigned to the Italian goldsmiths. One or two of the continuous scrolls in the ornament might, so far as their general appearance goes, be either Byzantine or Venetian: here again there is a common origin in antique art, and the vote may be cast in favour of Venice. Taking the find as a whole, we conclude that if the double adjective Veneto-Byzantine is used to describe these ornaments the emphasis should certainly be placed on the first rather than the second word.

The personal ornaments of the Middle Ages are rare, more rare than those of earlier epochs, when such things were buried with the men and women who had worn them. For this reason, perhaps, they make a special appeal to sentiment; they recall to us the less aggressive side of that knightly life which we commonly associate with the spirit of adventure and the body continually under arms. These ornaments from Chalcis are thus a valuable complement to the armour which Mr. Foulkes has described; some of them may have been worn in more peaceful hours by the very persons who fought in those heavy helmets and cuirasses, others by members of their families and households. There is hardly anything among them which does not form a useful addition to the scanty stock of mediaeval objects of their kind, and we owe much to the generosity of Sir Wollaston Franks and Mr. Fortnum, who bequeathed to public collections objects of such exceptional importance. Nor are they less interesting because, in great part, they represent only the average work of their time. Apart from some of the rings, which are of great delicacy, they are not of supreme excellence; many are of small intrinsic value. The period was one of ex-

travagance in personal adornment; it was an age in which men spent freely on jewels and apparel, and carried much wealth upon their persons. Compared with the possessions of princes and great nobles enumerated in contemporary inventories, many of these Chalcis ornaments are simple things, and would have been held cheap by the greater arbiters of elegance. If we read the lists of jewels in the possession of princely or ducal families in any of the chief European countries at this time, we are dazzled by the bare descriptions. Take from the inventory of the Visconti, dating from the year 1389, the example of a single girdle thus described: *Una cintura d'oro con fermaglio, con zaffiri, due balassi, quarantasei perli, trentaquattro grosse, cinquantasei diamanti, e dieci once di perle piccole.*¹ This is but one of many girdles among a whole treasury of costly things—gemmed crowns and diadems, collars, ropes of pearls, chains, brooches, rings—to say nothing of plate and sumptuous vestments. In France it is the same story. In the inventory of Charles V there are at least twenty-five girdles worn by kings and queens of the House of Valois:² *Item, une sainture, en laquelle a soixante assiettes, et en trente d'icelles, a, en chascune, deux saphirs, deux rubiz et quatre grosses perles, et en chascune des autres trente assiettes, a ung ruby ou mylien; et au mordant de ladicte seincture a cinq gros saphirs, cinq rubiz, quatre dyamans et vingt grosses perles; et en la boucle a troys gros rubiz et six petitiz, trois gros saphirs, quatre dyamans et seize grosses perles* (no. 58). It is the same in Burgundy. In the year 1375 the jeweller Jehan de Brabant receives payment *pour 5 dyamens, 5 grosses perles et un balay, que Mgr. a fait acheter de lui et a fait mettre en sa bonne ceinture et en 2 jarretiers.*³ There is no difference if we turn to our own country. The inventory of Henry V describes many girdles of silk and other rich fabric 'garniz d'or';⁴ in one the gold simulates hawthorn branches; another is enamelled, a third is enriched with pearls. As for girdles with ornament of mere silver-gilt, they are entered in groups or batches, one of which comprises no less than seventy-nine examples. With objects of this royal splendour the ornaments with which we are concerned enter into no rivalry; they are of a less costly nature, and made by goldsmiths of less repute than those who worked at the command of princes. But a glance at the illustrations to these notes will show that, though much of their work lacks

¹ B. Corio, *Storia di Milano eseguita sull' edizione principe del 1503 con prefazione del Professore Egidio de Magri*, vol. ii, p. 350 (Milan, 1856).

² J. Labarte, *Inventaire du mobilier de Charles V*, pp. 30, 32 (Paris, 1879).

³ B. Prost, *Inventaires mobiliers et . . . Comptes des Ducs de Bourgogne*, no. 2297.

⁴ *Rotuli Parliamentorum*, vol. iv, pp. 215, 218, 219, 220, 221, 227.

finish, they were men living in the atmosphere of a good tradition ; they had a sense of style and an instinctive feeling for proportion too often absent from the craftsmanship of our own day.

The thanks of the Society are due to the Keeper of the Ashmolean Museum for kindly permitting the rings in the Fortnum Bequest to be drawn and reproduced in these pages.





CAERWENT: PLAN OF HOUSES VIIIⁿ, XXIIⁿ, XXIIIⁿ, XXIVⁿ, XXVⁿ

XIX.—*Excavations at Caerwent, Monmouthshire, on the site of the Romano-British City of Venta Silurum, in the years 1909 and 1910.* By THOMAS ASHBY, Esq., D.Litt., F.S.A., ALFRED E. HUDD, Esq., F.S.A., and FRANK KING, Esq.

Read 26th May, 1910, and 16th February, 1911.

THE excavations of 1909 were commenced on the 21st of June, 1909, and work was continued until the 6th of December. The work was carried out under the direction of Messrs. Ashby, Hudd, King, Jones, and White.

HOUSE NO. VIII x (plate LVII).

The completion of House no. VIII x was the first work taken in hand. The house was first discovered in 1903, but the complete excavation of it was impracticable, as the ground was not then the property of Lord Tredegar. Three rooms had been partly uncovered, and the walls of these were traced into the adjoining meadow. The house when completely excavated was found to contain nineteen rooms, arranged rather irregularly round three sides of a courtyard, the eastern side being bounded by the street running north and south. This was the only street of the city of which we had not already found traces, and it is now practically certain that the city was divided into twenty *insulae*, by four streets running north and south intersecting the three streets running east and west.

The western portion of the house seems complete in itself, consisting of a series of rooms (1 to 9) opening from a corridor, which itself opens into the courtyard at the south-east angle of Room 9. Room 1 was heated by a hypocaust, only four of the stone *pilae* of which, 2 ft. in height, were left standing in the south-east corner of the room; and a small portion remained of the red sandstone border of a tessellated pavement. The *tesserae* were $1\frac{1}{4}$ in. square, while some smaller red, black, white, and blue *tesserae*, $\frac{1}{2}$ in. square, from the centre were found in 1903. Here were also found, both in 1903¹ and in 1909, several flanged tiles with scored backs and curious curved depressions in the flanges.

These tiles were used to form a hollow wall, and so allow the hot air from

¹ For the description of the western portion of House no. VIII x, Rooms 1-3, excavated in 1903, see *Archaeologia*, lix, pp. 109, 110, and pl. x. One of these tiles is figured on p. 109 (fig. 10).

the hypocaust to circulate completely round the room. The same arrangement was found in the baths excavated by Mr. Octavius Morgan (*Archaeologia*, xxxvi, p. 432).¹

Room 1 had been extended westwards in later times, as a suppressed wall prolonging the west wall of Room 2 northwards could be traced by the trench dug for its foundations, 2 ft. 1 in. wide and 3 in. deep below the level of the floor on which the *pilae* of the hypocaust rested. The furnace opening was in the south wall of the room, and the hypocaust must have been stoked from Room 2. The moulded cap of a small column (fig. 1), 10 in. by 11 in. on the top and from



Fig. 1. House no. VIII s. Cap of small column.



Fig. 2. House no. VIII s. Fragment of decorated stone slab. 4.

a column 6 in. in diameter, was found lying on a level with the bottom of the hypocaust *pilae*, and a fragment of a slab of Bath stone with one edge decorated (fig. 2). The room was entered from Room 4.

Room 2 was evidently open to the air; the hypocaust of Room 1 was stoked from this room, and along its eastern wall was found a large quantity of stone roofing-tiles and several with square ends from the eaves of the roof, as if they had slipped from the eaves over the west wall of Rooms 5 and 6.

Room 2 may have been entered from the west, though for this there was hardly space if the rough apse wall just to the west of it was in existence. There was also a doorway into Room 3 on the south and another into Room 5 on the east.

In Room 2 were found a coin of Constantinopolis and a limpet shell, while close to the east wall was the upper portion of a large pitcher of coarse black ware, and close to the south wall a large iron key.

No floor was traceable in Room 3, which opened into Room 7 on the east. Near the north wall and 3 ft. from the grass level coins of Victorinus and

¹ Similar tiles have since been found in the ruins in Whitewall Brake, called Castle Tump (Ordnance Survey, 25 in., Monmouthshire, sheet xxx. 7, no. 65), about one-third of a mile to the north-east of Caerwent, which from their plan, the character of the construction and the mortar, are undoubtedly those of a Roman villa. Mr. G. Colston, in some excavations he carried out there, found a mosaic pavement 6 ft. square, with *tesserae* 1 in. square. In the central portion, 1½ ft. by 1 ft., was a design of chequers in black and white.

Constantius II were found. Close to the south wall two large blocks of calcareous tufa were found shaped as the voussoirs of an arch: they measured $17\frac{1}{2}$ in. by $10\frac{1}{2}$ in., and tapered from $5\frac{1}{2}$ in. to $4\frac{3}{4}$ in. The west wall of the room, it was noticed in 1903, was carried on two large slabs of sandstone over the stonework of the well, which lay immediately outside it to the north-west.

Room 4 had a fine tessellated pavement, only very small fragments of which remained.¹ The border was of old red sandstone *tesserae*, and the centre of smaller *tesserae* of white and blue lias, old red sandstone and brick. The pavement seems to have been much destroyed in late Roman or later times, there being a hearth of sandstone roofing-tiles in the centre of it, with an edging 2 ft. 9 in. by 3 ft. 6 in. A large bronze Saxon buckle and a bronze bracelet were found on the east side of the room, 1 ft. down from the grass level. A small portion of the drum of a sandstone column $9\frac{1}{2}$ in. in diameter was also found.

Room 4 was probably entered from the corridor on the east, and it also had doorways into Room 1 on the west, and possibly into Room 5 on the south. The wall between Rooms 4 and 5 was destroyed probably when the late hearth was constructed in Room 4.

Room 5 had a tessellated pavement with a border of old red sandstone *tesserae* and a centre of smaller white and blue lias *tesserae*. The room had doorways into Rooms 2, 4, 6, and the corridor on the east. A flat round stone, 1 ft. 8 in. in diameter, was found in the corridor, and may have formed a step into Room 5, but the east wall had been much pulled about, and there was no certainty about this.

No trace of a floor was found in Room 6, and a trench cut across the room revealed nothing; but close to the south wall a coin of Constantius II and a lead plumb-bob or weight were found. The room was certainly entered from Room 5, and perhaps from Room 7 and from the corridor on the east.

Room 7 was entered from Room 3, perhaps from Room 6, and from the corridor. On the east side of the room a coin of Constantine the Great was found 2 ft. from the surface, and another coin of Constantine and a bronze brooch in a trench cut across the room. The walls of Room 7 A were not preserved high enough to show any doorways, and no sign of a floor was visible. This was probably only a shed, with a lean-to roof, and almost certainly added later.

Room 1 (in its earlier shape) and Room 2 may have formed one continuous corridor on the western side of the house.

Room 8 seems to have been entered from Room 9, and not to have had an entrance from the corridor. Just outside the south-west corner of the room the fragments of three pewter pots were found. Another trace of alteration in this

¹ It is noted by Octavius Morgan (*Archaeologia*, xxxvi, p. 425, pl. xxxiii), 'No. 1, remains of tessellated pavement, disturbed and partly destroyed.'

house was an earlier wall on the east side of Room 8, below floor level. Most probably this had only been an alteration in the division between these rooms, the earlier door having been at the north end.

Room 9 had had a tessellated pavement, but only a few loose *tesserae* were to be found, and it was probably entered from the corridor. A fine bronze cross-bow fibula (fourth century A. D.) was found in the south-west corner of the room 1 ft. below the grass surface, but a trench across this room revealed nothing.



Fig. 3. Column in Angle of Room 11, House no. VIII x.

The courtyard had on the north side a gravel floor 1 ft. 6 in. below the grass level; under the gravel a layer of lime rubbish, and below this again a bed of stone chippings—refuse, no doubt, from the building of the walls. The rest of the yard was carefully trenched, but yielded nothing of importance.¹

The space we have numbered 10 was probably not a room but a recess of the courtyard, with a door into the space north of the house, and between it and the city wall. A quantity of whelk and oyster shells and a stone with wall plaster sticking to it were found in a trench cut across the space. The plaster was coloured red, yellow, and purple. A drain in the natural clay bottom was found as shown in the plan.

¹ In the north-west corner of the courtyard a bow fibula was found; it had no spiral spring, an elongated cross-piece at the top, and a ring beyond this. It probably belongs to the second century A.D.

Rooms 11, 12, and 13 form a block to themselves, the east side being next to the street and the main entrance from the courtyard. The block was probably used as a workshop. Room 11 had a curious construction in its north-west corner; a small column, 8½ in. in diameter, was built into the angle, with a slab of stone 3 ft. 1 in. by 2 ft. 2 in. laid across the angle in front of it (figs. 3 and 4). This may possibly have been a domestic altar or a niche to hold a statue or statuette. The top of the column was level with the top of the wall as preserved, and 1 ft. 3 in. above the top of the slab. No trace of any other paving was found in the room. Many fragments of pottery and some twenty coins were found in this room of the following emperors: Tetricus (2), Claudius Gothicus (6), Antoninus Pius (1, silver-plated, Cohen 301, found under the south wall of the room), Probus (1), Carausius (1), Allectus (2, very good), Constantine I (1). The coins of Allectus are in mint condition. Room 11 was entered from Room 13 on the south.

Room 12 had a rough gravel concrete floor, and was entered from Room 13. Built into the north wall of Room 12 was the cap of a column of the same pattern as that in Room 11. No doubt both of these came from the ambulatory round the courtyard. Two lower millstones and a fragment of a drum of a column were found here. Coins of Claudius Gothicus and Tetricus I were found on the east side 1 ft. 6 in. down from the grass level. Room 13 occupied the whole of the southern portion of the block, and had two small enclosures off it, one in the north-east corner, not paved, and the other, paved, in the south-west corner. The floor was laid with sandstone slabs and the lower stone of a quern was found near the south-west angle. The paving on the east side of the room was at a slightly higher level than that on the west. Forming part of the rough pitching of the enclosure in the south-west angle and set regularly in its centre was an inverted plain chamfered base (fig. 5), the top measuring 1 ft. 5 in. by 1 ft. and the bottom 1 ft. 10 in. by 2 ft., and 10 in. high. In the north-east corner was a quantity of dark red-coloured plaster with white painted lines on it. The main entrance was in the south wall of Room 13, leading into the courtyard, but only small fragments of the threshold stone were preserved.

The block (Rooms 14-19) which bounded the courtyard on the south side was not well preserved, and the positions of the doorways could not be traced.



Fig. 4. House no. VIII N.
Column in Angle of Room 11.

Adjoining the east wall of Room 14 was a longitudinal furnace, 3 ft. 3 in. long by 1 ft. 2½ in. wide inside, and in the north-east corner under the old red sandstone slab paving a pit was found. Just under the slabs was a coin of Constantius II, and from 3 ft. 6 in. to 4 ft. 6 in. down some Samian pottery, one piece bearing the mark MAIN/. At 6 ft. down a worn first brass of Vespasian was found, and, just below, three bow-shaped fibulae¹ and a bronze ring. A fine Samian bowl² (Dragendorff 37) (pl. LVIII, fig. 3) in fragments was found at 14 ft. 6 in. down. This bowl has been very carefully put together by Dr. John Cropper, and is now in the museum at Caerwent. There were seven rivet holes in it, where it had been mended in Roman times. On the south side of Room 14 coins of Constantine I, Constantius, and Constantinopolis, and one Urbs Roma were found.

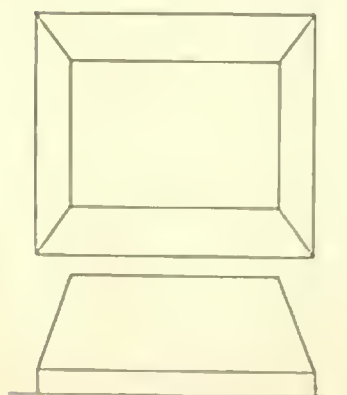


Fig. 5. House no. VIII n: Chamfered base. ¼.



Fig. 6. House no. VIII n: Column base, ¼.

In the south-west corner of Room 15 a pewter dish 13 in. in diameter was found, and in the south-east corner of the courtyard a number of fragments of pottery. There was rough paving in Room 18, and the straight joints in the walls showed that Rooms 18 and 19 were late additions. There was no definitely

¹ One of these has a plain knob at the upper end of the bow: another has a rectangular plate in the centre of the bow, which was decorated with a circular pattern in enamel: the third is small and plain. They probably all belong to the second century A.D.

² The elements of decoration, in metopes and panels, are as follows:

Upper metope, B.M. Cat. M. 44.

Lower metope, not in Déch. (vase).

Upper metope, Déch. ii. 750 (lion in inverted half wreath).

Lower metope, Déch. ii. 948 (rabbit).

Panel, Déch. ii. 344 (nude male figure to right).

The above is repeated four times.



Fig. 1



Fig. 2



Fig. 3

Fig. 1. Cinerary Urns found in 1909 and 1910
Fig. 2. Samian Bowl. Pit, House no. XVIII s

Fig. 3. Samian Bowl. Pit, Room 14, House no. VIII s

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marked entrance to the courtyard of the house in the street boundary wall, the east wall having been much destroyed.

To the south of Room 18 a well was discovered; the four coping stones, blocks of sandstone 1 ft. 6 in. wide, still lay in position 2 ft. 4 in. below the grass level, forming an opening 2 ft. 2 in. square. Just below them the masonry began to be circular. At a depth of about 2 ft. a bronze enamelled fibula (a circular disc with a six-pointed green star on a blue ground) was found; but with this exception down to 18 ft. from the grass level only a number of stone roofing-tiles and rough blocks of building stone came out, no pottery being discovered; 23 ft. from the grass level a drum of a column 2 ft. long and 9 in. in diameter, with a necking on it, was found, and just below it the base of the same column came to light (fig. 6). Water was reached 25 ft. down; at 26 ft. 6 in. fragments of a human skull, part of the lower jaw, arm-bones, and ribs were found, and at 27 ft. down a hazel twig 6 in. long and an inch in diameter. Further down more human bones, fragments of black pottery, and pieces of oak were found. At 28 ft., where the stonework was very good and the diameter 2 ft. 9 in., was a spindle-whorl of Kimmeridge shale and more pottery and bones. The bottom was reached at 30 ft. below the grass level; the clay was dished 8 in. down to the rock bottom, and the diameter was 2 ft. 8 in. Samples of mud were taken, and were found to contain (according to Mr. E. T. Newton's report): at 26 ft. down remains of field-vole, field-mouse, weasel, toad, a small bird, etc.; at 28 ft. down, dog (toe bone), field-vole, seeds and fragments; at 30 ft. down, mouse, shrew, toad or frog, jackdaw and fish-bone.

HOUSE NO. XXII N.

House no. XXII N occupies the eastern frontage of the street running north and south, directly opposite to House no. VIII N. It contains eleven rooms, and is quite unlike any other building as yet discovered at Caerwent. The house has a frontage of 110 ft. to the street, and for the most part is only two rooms in depth from the street frontage line. Room 1 had a pavement of rough slabs of stone: excavation under the slabs revealed nothing of note. Room 2 had a good gravel concrete floor 3 ft. below grass level, and was entered from Room 7. The wall between Rooms 1 and 2 was not preserved high enough to leave any trace of doorways. The west wall of Room 2 had the plaster still preserved 1 ft. 6 in. above the floor level. The plaster was pinkish white in colour, and was decorated with splashes of red and yellow. A coin of Constantine I was found on the west side of Room 3 three feet below the grass level. This room had traces of a gravel concrete floor at its northern end, but no floor was traceable at the south

end, where there were some curious trenches cut in the red clay. Room 3 had a doorway into Room 4 on the south, but the east wall was too much destroyed to show any entrance. Room 4 was a narrow passage, and nothing was found here to indicate the use of it, or of the small enclosure at its eastern end: under the wall separating this from a similar enclosure in the south-east angle of Room 3 a small pit was found. In Room 5 we had evidence that the site of this house had been used as a rubbish tip before the house was erected. The clay was dug out for some purpose, and the resulting hole filled up with rubbish. The west wall of Room 5 had been built over one of these large holes, the foundations had given way, and the wall had bulged inwards and cracked. A portion of the rubbish pit was excavated down to the natural stratum at the bottom, 13 ft. from the grass level; a large quantity of pottery fragments were discovered, and at 10 ft. deep a second brass of Domitian was found. The pointing of the masonry on the outside face of the south wall of this building was in a good state of preservation.

The south wall of Room 6 was not preserved above the foundations. The eastern wall was better preserved, but was not parallel with the west wall. A good bone knife-handle was found in this room. Room 7 had a good pavement of red brick *tesserae* preserved at its western end, but the pavement was destroyed at the east end and in the apse, the walls of which were not preserved up to the floor level, as shown by the pavement. Several small white and blue lias and red brick *tesserae* were found in the apse, which probably had a finer pavement. Coins of Tetricus I (2), Theodora Augusta, Constans, Constantius II, Valentinian I, and others, all much worn, were found in the room. The apse was in no way bonded into the walls of the room, but that it was at least contemporary was clear from the fact that the wall approaching it on the west passed over its footing. Coins of Allectus, Carausius, and Constantine were found in the apse. Only the footings of the walls of Rooms 8 and 9 were preserved. The wall between 8 and 9 was earlier than the east wall of Room 3, and contemporary with the earlier walls in the south-east angle of that room. Rooms 8 and 9 were probably, in later times, one large room or space, but so very little of the walls was preserved that it was a difficult matter to decide. A bronze bow-shaped brooch with elongated cross-piece was found on the east side of Room 8, and a coin of Magnentius in the south-east corner. A coin of Carausius was found in Room 9. The plan of the group formed by Rooms 1, 2, 6, 7, 10, and 11 resembles somewhat that of an early church, but it would be very rash to assert that it was such a building. It is to be noticed that this part of the house was not directly accessible from the street.

HOUSE NO. XXIII N.

House no. XXIII N¹ is directly south of House no. XXII N, and separated from it by a space of about 2 ft. Coins of Constans and Constantinopolis were found 3 ft. below the grass level in this space. The house consists of a double range of rooms with a courtyard to the south, the courtyard being entered from the street on the west of the house. The entrance, 9 ft. wide, with wing walls on each side of it, appears to have been blocked up by a rough wall, only one course of which was preserved.

No trace of the floors of the rooms was found except in the south-west corner of Room 10, where a gravel concrete floor was preserved. There appear to have been two entrances from the courtyard, one into Room 8, with a good threshold stone and a small porch in front of it, and further east into Room 10, where the two square bases in the courtyard may possibly show the position of a porch in front of a doorway. The two flat slabs just inside the room and close to the wall rather strengthen the supposition, although the easternmost slab of the two was found to be part of a moulded base turned upside down. The rooms in the north range (1-6) were all small, and very little of interest was found in them. The north wall of the house had a set-back towards the north at the north-east angle of Room 4; this was probably due to reconstruction of the western portion of the wall, as was indicated by the fact that the eastern portion joining the north wall of Rooms 5 and 6 is not bonded with the western portion, but goes beyond it, and ends with a broken end. Coins of Gallienus and Constantius II were found in Room 1, and a pair of tweezers close to the south wall of the room.

Room 3 contained a quantity of broken red roofing-tiles, and under these, 3 ft. below grass level, was a layer of charcoal and ashes. In the north-east angle of the room was a sandstone slab roughly triangular (fractured) in shape, 1 ft. 6 in. by 2 ft. 2 in. by 2½ in. thick, and having a semicircular hole (originally circular, now broken), 1½ in. in diameter, in its largest side. A fragment of an upper millstone was also found in this room, and part of a bronze bracelet was found in Room 6. The south wall of Rooms 1-6 was not preserved above floor level, although the natural stratum was reached along this wall 3 ft. 6 in. to 4 ft. below grass level, and the walls were carried right down on to it.

Room 7 was probably entered from 8, which was the entrance hall of the house. The threshold stone of the entrance from the courtyard, 5 ft. in width, was preserved, and the holes for the door pivots were clearly marked. The two short walls running south on each side of the doorway are probably the foundations of a porch. The double doors opened inwards, as is shown by the position of

¹ A small steelyard of bronze with graduated beam was found in the tip from this house, but its exact provenance could not be determined.

the step on the threshold. It does not seem to have been possible to enter Room 8 directly from Room 9, the wall between the rooms being preserved higher than the level of the threshold into Room 8. Room 9 had plaster preserved on the wall in its north-east angle, but no decoration could be seen; this room had a doorway into Room 10 on the east.

Room 10 is the largest and most interesting room in the house; it had a gravel concrete floor preserved in the south-west corner, and the west wall was plastered, but no decoration was traceable. Small fragments of red, white, green, and yellow-coloured plaster were found in the room.

Another large pit similar to the one in Room 5, House no. XXII x, was discovered under the slabs of yellow sandstone which formed part of the paving of the room, and which had sunk 8 to 10 in. out of level. One of the slabs

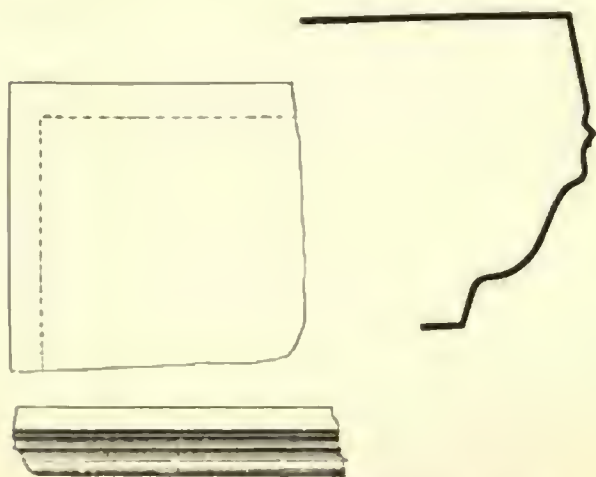


Fig. 7. House no. XXIII x: Moulded slab. $\frac{1}{4}$ in.

was moulded (fig. 7). Excavation to the bottom of the pit only revealed fragments of common black and red pottery, and a plain bow fibula with elongated cross-piece, no loop, and a plain sheath. Just east of the pit was a hearth of old red sandstone roofing-tiles on edge, measuring 3 ft. 5 in. square, and at the north-west corner was part of a hypocaust flue tile in an upright position. Close to the hearth, coins of Tetricus I, Constantius II and others, corroded and illegible, were discovered, and under the slabs were found coins of Victorinus, Tetricus, Theodora, and Constantine I,

and others illegible, having suffered much from fire. A coin of Valens was also found on the south side of the room. From the thick layer of ashes and charcoal and the mass of old red sandstone roofing-tiles and pieces of stone ridge-tiling found, it is probable that the room was destroyed by fire, and that the roof fell in.

Running from the south-west angle of Room 10 and as far as the easternmost base south of the room was a well-built wall, but nothing was found to throw any light on its use; as its north-west end is broken off, it would appear to be earlier in date than the house. To the east of the sandstone bases and 2 ft. 6 in. south of the south wall of Room 10 three black pear-shaped pots (pl. LVIII, fig. 1, nos. 1, 2, and 3) were discovered, the centre one being the largest; the two to the west were found to contain burnt human bones, and the other was empty. The top of the pots was 1 ft. 6 in. below grass level, and they seemed to have been covered with rough pieces of old red sandstone. Close to the pots, which were 2 ft. apart,

a second brass of Domitian was found. In cutting trenches across the courtyard south of House no. XXIIIx a well was discovered with one of the original coping stones in place 1 ft. 6 in. from grass level; on the stone was found a second brass of Antoninus Pius, and in the trench just to the north-east a second brass of Commodus. Down to 17 ft. below the grass level the well was found to contain rough stones and very little mud. At 17 ft. a perfect plain grey pitcher with one handle was found; at 17 ft. 8 in. a coin of Valens, and from this point downwards fragments of several broken pitchers, a few small fragments of Samian ware, and pieces of the hoops of a bucket were discovered. At 22 ft. down a coin of Constantius II came to light. The bottom of the well was reached 26 ft. from grass level, and very little water came in. A sample of the mud from the bottom was taken and sent to Mr. Lyell. The masonry of the well was good, and went down to the solid rock; there was no sump-hole as in some of the Caerwent wells; the diameter at the top was 2 ft. 4 in., and at the bottom 2 ft. Just south of Room 9 the yard was pitched with rough stones and rammed gravel, but the pitching was not found east of the east wall of Room 9. The wall just south of the south wing wall of the entrance was probably a later addition, after the entrance to the street was blocked. There were some fragments of old red sandstone paving just to the south of the wall.

HOUSE NO. XXIV x.

House no. XXIV x consisted of a series of buildings of different dates and peculiar plans, not corresponding to those of any ordinary Roman domestic building. The earliest building consisted of the three Rooms 6, 7, and 9, Room 9 and the apse under 10 forming one large room with two doorways, one in the apse at the east, and one to the south, as shown by the large sandstone blocks. It is probable that the apse was originally complete, the large doorway being inserted later. The form is curious, and a plan is therefore given (fig. 8). The thresh-



Fig. 8. House no. XXIV x: Plan of threshold. $\frac{1}{32}$.

hold stone at the south-east corner of the yard (no. 12) was probably of the same date. Rooms 6 and 7 were paved with old red sandstone *teserae*, and the floors were in a good state of preservation, although only the rough foundation of the walls could be found. Just to the west of the threshold in the apse of Room 9 was some rough slab paving.

A building of entirely different plan was next erected, and it consisted of

Rooms 4, 5, 10, 11, and 12.¹ Rooms 4, 5, 10, and 11 were probably roofed, and 12 was an open yard. Room 4 had an apse at its western end, with small pilasters on each side, and a wide opening into Room 5, the same width as the distance between the pilasters of the apse. The apse was built square on the outside, not circular, as was usually the case here. There were some rough slabs near the east end of Room 5. What use these two chambers may have been put to is doubtful, but their plan rather suggests a small church, in which Room 4 would be the chancel with two small transepts and a wide opening to the nave, Room 5. The rough slabs near the east end may possibly have been foundations for a screen to form a narthex. This is, however, very doubtful. Rooms 10 and 11 were built over and completely covered the apse and threshold of the earliest building. In Room 10, over the apse, were found a large quantity of fragments of a very fine mosaic pavement, scattered about at various depths. The *tesserae* were small, and were of various colours.²

Under the floor of Room 6 on the east side, 3 ft. 6 in. down, was found a bow fibula with elongated cross-piece and spiral spring decorated, and in this room was also found a bow-shaped fibula with plain bow, large elongated spiral, and plain sheath.

In the last stage the building consisted of Rooms 1, 2, and 3, and probably some of the rooms of the middle period were also preserved. The building of the well-built foundation of the wide south wall of Room 3 completely destroyed Room 4 (the foundation is 4 ft. wide, but the wall only 2 ft.), and the opening into Room 5 was also built up. When we pulled down the wide wall where it passes over the northern pilaster of the apse, we found the pilaster complete under it, and the northern quoin of the opening between Rooms 4 and 5 was similarly preserved under the late wall. On the east side of Room 1 there were the remains of two walls close together, one of which had been almost entirely destroyed; the south wall of the room had also been taken out. On the west side of the room and just above the rough mortar floor a hoard of about 1,450 coins was found, all minims of the end of the fourth and beginning of the fifth century.

Below the floor level some Samian ware was found, including fragments of several plain cups (Dragendorff 33). Room 2 had a wide doorway into Room 3, which still had its threshold stone preserved. The stone was grooved for the wooden door frame. There was a hearth of sandstone slabs, all much burnt, in the centre of Room 2. The eastern portion of Room 3 had a pebble floor about

¹ These rooms have been kept open for the inspection of visitors.

² This early building, of which unfortunately very little is left, was certainly not an ordinary Roman house, and must have been a public building of some sort. It has been suggested that it may have been the early basilica, destroyed and built over after the construction of the later basilica further west.



Fig. 1



Fig. 2



Fig. 3

Fig. 1. Finial. From House no. XX s Fig. 2. Altar. From House no. XVI s Fig. 3. Altar. From Pit, House no. XXIV s

1 ft. 10 in. below grass level, and in the south-west corner of the room just in front of the threshold was a pit. It seemed to have been a trial shaft for a well, similar to pit C 1908,¹ but no water being found it was used as a rubbish pit. The soil was mixed to a depth of 8 or 10 ft. from grass level, and reddish for the next 6 ft. At 18 ft. below grass level was a grey layer, and then red clayey loam to the bottom. A considerable amount of ordinary pottery was found in the last three feet, there being several perfect red, black, and grey pots, together with a small sandstone altar, without inscription (pl. LIX, fig. 3), which had been much burnt. The pit was 21 ft. 6 in. deep, and the only coins found were two of Domitian (worn) at 7 ft. 6 in. and at 8 ft. 6 in., and one of Licinius at 16 ft. from the grass level. A bow fibula of bronze, with elongated spiral and no loop, the bow being decorated (no knob), was found 12 ft. 6 in. down.²

On the north wall of the house near the north-east corner of Room 2 a hoard of about 430 small brasses was found. The dates of the coins ranged from Gallienus to Honorius, including Claudius Gothicus, Helena, Theodora, Constans, Julian 'the Apostate' (a curious little coin with head to right, inscribed IMP. JUL.), Magnus Maximus, Victor, Arcadius, Honorius.

A large well, 3 ft. 6 in. in diameter, was discovered just west of Room 7: the masonry was in a good state of preservation, and water was reached at 20 ft. below grass level. At 21 ft. down the base and part of the drum of a small Bath-stone column 9½ in. in diameter were found, and a large quantity of animal bones. Fragments of antlers of red deer and some pieces of leather sandals were discovered from this point to the bottom. Numerous fragments of hazel twigs were also found. The stonework stopped 4 ft. 6 in. from the bottom, and was carried on large slabs of stone; the sump-hole was cut in the hard red clay, and the bottom was reached at 26 ft. All the wells we have found at Caerwent, so far, appear to be surface wells, and the water in them rises and falls with the rainfall. In the winter time the level of the water is generally about 3 ft. from the grass level. To the west of the well a black cinerary urn (pl. LVIII, fig. 1, no. 4) and a small pot of unglazed red ware were found in a trench 1 ft. 6 in. below the grass level.

HOUSE NO. XXV N.

House no. XXV N is a small house of the Caerwent courtyard type, approached from the street on the south only, there being no entrance from the street on the west. The front walls were very much ruined, but most probably the entrance was through the space numbered 12 into the courtyard. Crossing

¹ *Archaeologia*, lxii, and pl. i.

² From this pit in Room 3 Mr. Newton reports remains of the following animals: fox, bank-vole, water-vole, field-mouse, weasel, shrew, and fragments of snail shells, *helix rotundata*, etc.; and from the well of the house remains of ox, sheep, pig, mouse, vole, marten (?), teal, robin, hedge-sparrow, wren, and other birds, frog or toad, blindworm, fish (*achatina*) and fragments of shells, *helix* etc.

the courtyard, which had a rough pitching at a depth of 2 ft. below the modern grass level (a bronze cross fibula—fourth or fifth century—was found six inches above the pitching), we enter a corridor (no. 8 on plan), which gave access to the rooms on the north side of the courtyard by a doorway in the centre. In front of the doorway there were traces of old red sandstone slabs, as though the paving of the courtyard had at this point been more regular. The threshold stone was

a slab of yellow sandstone with a square hole in the centre; there were no slits for the door frame, and possibly there was only a light wicket gate, for it was certain the corridor was not closed on the south.

A column 3 ft. 5 in. long (fig. 9) was found some 17 ft. east of the doorway lying close to the wall, and it undoubtedly belonged to the verandah. We have therefore to suppose that the wall rose to the height of some 3 ft., with stone columns above. A very striking modern parallel to such an arrangement may be seen in several houses in Abbasanta in central Sardinia. On each side of the doorway pilasters project inwards about $3\frac{1}{2}$ in. The corridor was paved with old red sandstone *tesserae*, which were preserved in places. In front of the doorway was a panel of coloured mosaic, the guilloche edging of which in red, white, blue, and yellow, was alone preserved. Lying on the floor at the west end of the corridor a number of arch voussoirs 1 ft. 1 in. to 1 ft. 2 in. in depth were found. They had probably fallen from the arch over the doorway into Room 7. At the east end of the corridor was a narrow gutter 6 in. wide and 8 in. deep, which ran into the courtyard, and probably took the drainage from the roof over the northern range of rooms. There may have been another door into the courtyard here.

Room 1 had two concrete floors at different levels, the upper one 1 ft. below grass level and the lower one 2 ft. The plaster preserved on the west wall was pink with black splashes on it, and evidently belonged to the early floor level, as traces of a second layer pale mauve in colour could be found. The room could be entered from Room 2.

Room 2 had a concrete floor at the lower level, 1 ft. 6 in. below grass level, and was entered from the corridor and possibly Room 3 on the east. In Room 3 there were slight traces of a concrete floor, but no doorways could be definitely fixed.

Room 4 had a doorway into the corridor, which was roughly built up, and a doorway into Room 5. The concrete floor of the room was 2 ft. below the grass level, and there was a burnt layer 5 in. deep on top of it.

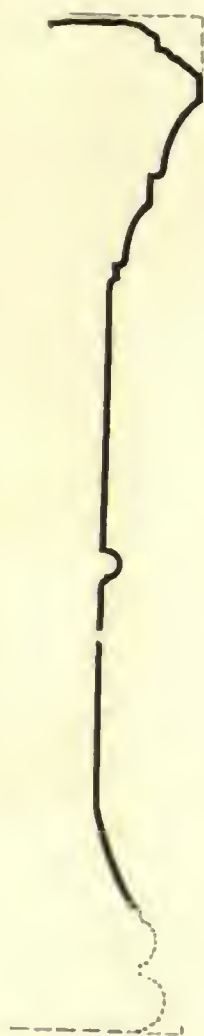


Fig. 9.
House no. XXV N:
Column. $\frac{1}{4}$.

Room 5 had a doorway into the corridor, part of the threshold stone of which was preserved. There was nothing to note about Rooms 5 A and 6 except that the walls were destroyed, only one or two courses being preserved above the foundation level.

Room 7 had doorways into the corridor and Room 10. The threshold slab of old red sandstone, 5 ft. by 3 ft., was preserved at the entrance of the corridor: under this slab were some bones of a sheep, and in this room a small circular buckle brooch was found. Near the south-west corner a small drain passes through the wall into the street, but its use is not clear.

Room 9 had a door into the east end of the corridor. The finding of the stem of a clay pipe close to the east wall of this room, about 3 ft. from grass level, made it clear that we were not the first excavators of the site.

Room 10 had a floor of *opus signinum*, and there were remains of plaster on the west wall, but no colour could be made out. The room was entered from Room 7, and possibly from Room 11. Nothing remains to be said about Rooms 11, 12, and 13 except that the foundations only of the walls were preserved. Room 12 was probably the entrance to the house, and Room 14 was paved with old red sandstone slabs, and had a doorway into the courtyard at its north-west corner.

STREETS.

The streets in this quarter of the city were surprisingly narrow and irregular; it is obvious that there was little traffic. The surface of the streets was about 13 in. below grass level, and was of very rough pitching: 6 in. below this was a layer of better pitching of large stones and gravel. A quantity of fragments of pottery, iron nails, and two coins of Valens were found on the second layer, and below this was the natural gravel. Trenches were cut across the streets, and the cross-roads were thoroughly examined, but no traces of water-pipes or iron collars could be found. The spaces south of the street south of the Houses nos. XXIV x and XXV x were evidently only used as gardens; nothing was found in them except to the south of House no. XXV x, where there were the foundations of a small structure: the walls were well built, but nothing was found to indicate its use. The space between Houses nos. XXII x and XXIII x and the north-east corner of the city wall was thoroughly trenched, but no traces of buildings were found.

The black soil was from 2 ft. to 7 or 8 ft. deep, but only a few fragments of common black pottery were found. It seems probable from the section of the trenches cut that this part of the field in Roman times had been a swamp or marsh. The pottery was all at the bottom, as would be naturally expected in that case.

The excavations of 1910 were carried on under the supervision of Messrs. Ashby, Hudd, King, and Jones in a field called the 'Gaer' and a garden adjoining, belonging to Mr. Joseph Edmonds, of Crick, Chepstow, which was secured for the purpose by the liberality of Viscount Tredegar, F.S.A., President of the Caerwent Exploration Fund. The field and garden are bounded on the north by the modern high-road, on the east by the approach to the churchyard and the churchyard itself,¹ and on the south and west by the large field containing Houses nos. I s-XIII s, which was excavated in the years 1899-1904. The area under examination thus included the eastern portion of the westernmost *insula* on the south side of the high-road and the greater part of the next one to the east of it; a small part of this falls within the limits of the churchyard, and a still smaller part was excavated in 1902.²

The excavations were begun in the western part of the field, and the eastern portion of the first-mentioned *insula* will therefore be dealt with first. The western end of the south boundary hedge of the field is upon the north wall of House no. II s,³ and the trenches which were cut at right angles to this soon revealed the north boundary wall of the street. The street here was some 17 ft. 6 in. wide, and was, as usual, paved with a layer of rammed gravel and stones from 6 to 8 in. thick. Coins of Claudius Gothicus, Tetricus, the Constantine family, and Valentinian I, and a small pair of iron shears were found on the street surface 2 ft. below the grass level.

HOUSE NO. XIV s (Plate LX).

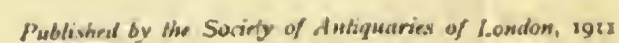
This house occupies the south-east angle of this *insula*. It consisted of a large yard, in the north-west corner of which was a small building of six rooms. The yard was roughly pitched, and was accessible from the street on the east, and probably from that on the south; the main entrance was obviously on the east side, where there was a gateway 8 ft. 6 in. wide, with wing walls on each side of it, the angles being slightly rounded. To the south of the southern of these two walls was another wall, with a broken end to the west. This may have belonged to a porter's lodge, or some structure of this nature. The south-east angle of the yard was rounded off, as it was at the corner of two streets. There was no definite entrance to the yard from the south, only a break in the wall 10 ft. in width, and further west the wall was broken away altogether. Between this and the south-east angle there was a later wall, preserved for a length of 25 ft. just inside and parallel to the yard boundary wall.

In the house itself none of the floors were traceable. The main entrance was in the south wall of Room 6, and was marked by a step of worn slabs of

¹ For excavations here in 1903 see *Archaeologia*, lix, p. 122.

² *Archaeologia*, lviii, and pl. xxiv.

³ *Archaeologia*, lviii, pl. xxiv.



old red sandstone in front of it. Rooms 5 and 6 probably formed a corridor giving access to the other rooms of the house. A small furnace or hearth, the bottom of which was formed by a slab of sandstone, was discovered in the north-east angle of Room 1, and there were traces of an earlier wall along the east side of the room. The garden or yard to the east of the house was thoroughly trenched, and just outside the north-east angle of Room 4 a black cinerary urn (pl. LVIII, fig. 1, no. 5) with a handle was discovered. On examination it was found to contain burnt human bones; the top of the jar was 1 ft. 3 in. below the grass level. Coins of Claudius II, Tetricus I, Allectus, Constantine I, Constantine Junior, Gratian, Valentinian I and II, Urbs Roma, Postumus, and Theodora Augusta were found in House no. XIV s and the yard to the east of it. In Room 3 a bronze buckle brooch in good condition, probably belonging to the middle of the fourth century A.D., two iron spear-heads (which are probably late Celtic) (pl. LXI, fig. 5), and an iron axe-head (pl. LXI, fig. 2, no. 1) were found.

HOUSE NO. XV s.

House no. XV s is situated to the north of House no. XIV s, and is separated from it by a yard measuring 54 ft. by 83 ft., which was probably entered from the street on the east. A break in the eastern portion of its south wall may have served as a communication with the yard of House no. XIV s. This house, like House no. XVI s, seems to have been formed out of three distinct buildings, apparently shops, each of which had a narrow frontage to the main road. It was not an easy matter to distinguish the different parts, and it was only in the front of the house that the three early buildings were clearly marked. The whole of the house had been so much altered and rebuilt that we have thought it advisable to describe it as we found it, pointing out the remains of the earlier constructions.

The whole front towards the main road was occupied by a verandah (2). The bases of the columns or posts which carried the roof were in part extant; there had evidently been seven, spaced 10 ft. apart from centre to centre. The bases measured 2 ft. to 2 ft. 6 in. square, and one or two of them had holes 3 in. square sunk in them. This verandah was approached from the street on the east by a flight of steps, which showed considerable traces of wear. They were of sandstone, and varied in width from 1 ft. 3 in. to 1 ft. 6 in., each having a rise of 6 in. The bottom step was on a level with the surface of the street. The verandah had been common to the three early buildings, and in course of later alterations was done away with, and another (1), encroaching upon the main road and projecting beyond the original frontage line of this house and the one to the east (XVI s), was placed to the north of it, and paved with old red sandstone *tesserae*.¹ At a still later period (possibly in the Middle Ages) some large but

¹ Under the *tesserae* were 3 in. of inferior mortar, and 3 in. below this was the hard gravel bed of the road, which was traced for a depth of 3 ft.

shallow foundations (Z on plan) were built over Room 1. Their nature and purpose is quite uncertain; they seem to have formed a part of some building over the high-road. It was in the south wall of the early verandah (2 on plan) that the three early buildings were most clearly marked. The wall shown in outline near the west end of the south wall of Room 2 was the north wall of the westernmost block; the south wall of Room 2, as far as the north-east corner of Room 4, was the north wall of the central block, and the continuation of the same wall eastwards formed the north wall of the eastern block. The western and central blocks had a double party wall, as was usual, but the eastern and central blocks appear to have had a single wall only.

The building, as preserved, consisted of a small courtyard with rooms arranged round it and a long corridor giving access to the other rooms. In its last state, at any rate, the building seems to have been used as a dwelling-house, to judge from the hypocausts and pavements that were discovered. The portion of the house to the east of the corridor consisted of a large open space with some small chambers in the south-east corner (16, 17, 18), and a cellar in the south-west corner (15). The west side of the house was occupied by a series of rooms (6, 9, 11, 12, 19, 23, 24) along the west wall, to the east of which were other rooms (10, 13, 14, 20). The rooms along the west side underwent no great alteration during the various reconstructions of the house. Room 6 had clearly marked doorways into Rooms 2 and 9. Room 9 may have been accessible from Room 11, which seems to have been a passage way, and may also have served as a means of access to Room 12 from Room 10. The spaces numbered 4 and 7 were originally one room, the wall dividing them having been inserted later, when 4 and 5 were thrown into the old verandah, 2 and 3 (which now became a corridor). There was no trace in Room 4 of the pavement of old red sandstone slabs which was to be seen in Rooms 7 and 8. It is possible that this pavement was taken up when the dividing wall was built, but, in view of the regular arrangement of the slabs, it may also be supposed that the pavement belongs to a period after the construction of the dividing wall. The discovery beneath it of a worn second brass of Domitian and of a fragment of a figured Samian bowl of the first century A.D. (Dragendorff type 29) is no bar to this supposition. We must regard the objects found under such pavements as perhaps belonging to rubbish brought from some other spot for the purpose of levelling up, not necessarily as testifying to the existence on that very site of buildings of a period to which they themselves belong. The loose earth in which the pottery was found continued for a depth of 1 ft. 6 in. below the slabs; then came the natural gravel upon which the wall foundations rested, and after 3 ft. of this the hard red clay. In any case, that the wall is later is proved by the discovery to the north of it, 4 ft. below the grass level, of another piece of the Samian bowl mentioned above, which



Fig. 1



Fig. 2



Fig. 3



Fig. 4

Fig. 5

Fig. 1. Iron Sheath for Wooden Spade. $\frac{1}{4}$
Fig. 2. Iron Axe-heads. $\frac{1}{4}$

Fig. 3. Carpenter's Iron Plane. $\frac{1}{11}$
Fig. 4. Iron Tools and Key. $\frac{1}{2}$

Fig. 5. Iron Spear-heads. Room 3, House no. XIV s. $\frac{1}{3}$

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fitted on to the fragment found under the slabs. The main corridor (8), which runs south for a length of 54 ft. to the courtyard of the house, was similarly paved, and so was the large Room 10 to the west.

Rooms 12 and 19 were originally one room, heated by a hypocaust, which was probably stoked from the west, but owing to the fact that the boundary hedge of the field lies upon the west wall of the house it was not possible to examine this wall with as much care as might be wished. The late dividing wall was built along two rows of *pilae*; some of the north row were left *in situ*, while some of those of the southern row were taken up and used as building material in the wall. No break was left in the wall, so that Room 12 must have ceased to be used as a hypocaust. It is, indeed, fairly clear that the whole arrangement was abandoned, for it seems that the original south wall of Room 13 was destroyed down to below the new floor level, which is nowhere actually fixed by any extant remains of it. A new south wall was also constructed in Room 19, by which the size of Room 23 was somewhat reduced. This is clear from the fact that this wall does not bond into the east wall of this series of rooms; its east end had been reconstructed with shallower foundations. Room 13 also formed a part of the area originally heated, having *pilae* of the same kind under its floor, and being connected with the hypocaust under Room 12 by three openings divided by rectangular piers of masonry, the northernmost of which had disappeared. It could not be ascertained if the openings had arched or flat coverings, or whether Room 13 had doorways into Rooms 10 and 14, as the walls were not preserved to a sufficient height. The south wall of Room 13 had been rebuilt, and no doubt at the same time the low wall was erected across the south-west angle of the room. Room 14 seems to have been an ante-room, paved with old red sandstone slabs, and forming an approach from the corridor to this range of rooms, which were evidently once the most important in the house. We must include with them Room 23, which once contained a mosaic pavement, of which, however, few traces remain, and also Room 24 at the south-west angle. There was a large doorway, 10 ft. wide, between these last two rooms, in which were remains of a pebble concrete floor, no doubt the foundation of the mosaic pavement. Under this floor, which was 3 in. thick, was found some Samian and other pottery, the former including the bottoms of two bowls (Dragendorff 31) with fragmentary marks *ivs/* and */F1*, a fragment of a bowl of form 37 with a decoration of vases (Déchelette 1072), and a piece of glass with the letters */AVD/* in relief.

The use of the space to the east of the corridor is very uncertain, and it is not clear whether the northern portion of it was roofed or not, though it seems so improbable that we have marked it 'yard' on the plan. The rooms or spaces in the south-east angle are unimportant, but the south-west corner contained a remarkable cellar (15), of a type not hitherto met with at Caerwent, but resembling

rather closely the treasure-chamber in the *praetorium* of a camp (pl. LXII, figs. 2 and 3). It was approached from the north by a flight of five steps, each 12 in. wide, giving a total descent of 4 ft. 2 in. The cellar itself measured 12 ft. 9 in. by 8 ft. 9 in., and was floored with good concrete of pebbles and fragments of brick and lime $7\frac{1}{2}$ in. thick, resting upon the natural clay bottom, upon which the side walls also rested. The walls, 5 ft. in height, were very well built in the usual style of construction of small blocks of limestone, and the marks of the tools used in pointing them could still be seen in the mortar. At the top the walls were flat, no doubt in order to carry a wooden floor. The cellar was lighted by a small window at the south end, 4 ft. wide inside, narrowing to 1 ft. 6 in. outside, but this was blocked up in later Roman times. Some alterations seem to have been made at the entrance; thus at *c* there are distinct traces of there having once been a wall across the opening, and it is possible that the cellar was originally a water cistern, or that it was entered by a trap-door in the floor above. It also seems clear that at *d* the western face of the wall has been added later, and that the narrow portion to the east, not at right angles to the rest, is earlier in date. The space to the east of the entrance rather suggests that it was at one time intended that the steps should go down parallel to the north wall of the cellar. In this space was found a second brass of Nerva,¹ in good condition, 4 ft. 6 in. from the grass level. The cellar was filled up with a large quantity of old red sandstone roofing-tiles, and amongst the débris a number of coins of Carausius, a fragment of a stone mould for casting metal objects, and the base and part of the drum of a small column (fig. 10, no. 1) were found.

The corridor (8) originally led into the centre of the north ambulatory surrounding the small courtyard,² which was drained by a stone drain crossing it diagonally, and then running due south across the south ambulatory and through the eastern portion of Room 25. The south ambulatory had traces of pitching and of another drain running along its south wall, the use of which was not altogether clear. The courtyard was paved with slabs of old red sandstone, beneath which a little common pottery was found. In the last state of the house this courtyard was much encroached upon. A room was taken out of it in the north-west angle, and alterations were made on the east side, where the dates of the various walls were very difficult to distinguish. It seems clear, however, that the cellar (15) was not a part of the earliest construction, inasmuch as the walls south of it must originally have continued northwards. The rooms to the east of the courtyard (21-22) were also added later, and seem to have been of some importance. In Room 21 some brightly coloured wall plaster, all in small fragments,

¹ Nerva, *Concordia exercituum*. Cohen, no. 71 (1st ed.), A.D. 96.

² The middle one of the three parallel walls at *a*, which is the earliest in date, seems to belong to a period before the construction of the courtyard; with what it is connected is quite uncertain.



Fig. 1



Fig. 2



Fig. 3

Fig. 1. House no. XVI s, looking North Fig. 2. Cellar, House no. XV s, looking South Fig. 3. Cellar, House no. XV s, looking North

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was found, and the quarter-round moulding and a little of the plaster were preserved *in situ* on the south wall of the room. The floor had been of a fine pattern mosaic, but the greater part of this had been removed by previous excavators, who had only left the border of old red sandstone *tesserae*. A portion of it, however, had subsided considerably, having been laid over an old rubbish

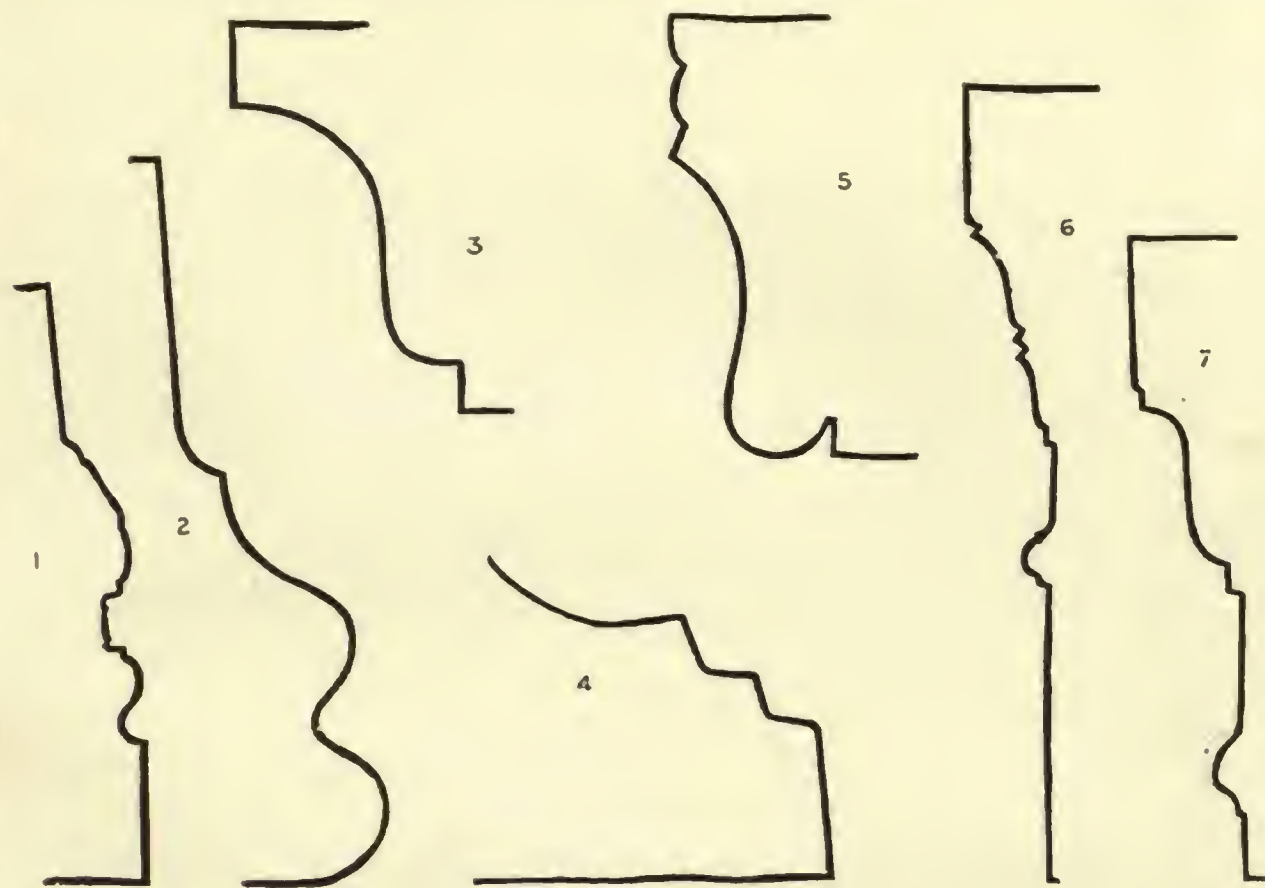


Fig. 10. Caerwent architectural fragments, 1910. $\frac{1}{8}$ in.

pit. This part of the pavement has been taken up, and is now in the local museum.

The large pit under the pavement was found to contain the following:

In the first layer, just under the pavement, a few oyster shells, fragments of common pottery, and a coin of Carausius in mint condition.

From 10 ft. 6 in. to 11 ft. 6 in. Samian potter's mark SENIIA . M.

From 11 ft. 6 in. to 12 ft. 6 in. Samian potters' marks /MARI/ and CERTUSE.

At 15 ft. from the grass level was a burnt layer from 2 to 3 in. thick, and no more finds were made until at 18 ft. down a quantity of common pottery occurred. From this point downwards the filling of the pit was quite black, and

consisted chiefly of charcoal and ashes. At 20 ft. down a bone die, with its sides numbered from one to six, was found. There was a large quantity of pottery from here downwards, and when this had been washed it was possible to restore completely three pots, a Samian bowl of shape 18 with an illegible potter's mark, a large *mortarium* with rather flat rim, and a plain bowl of yellowish pottery with twisted handles. The pottery was nearly all on the north side of the pit, as if it had been thrown in from the south side, and had rolled down to the bottom. It was noticed that the rubbish was in layers which sloped downwards from the south to the north side of the pit. The bottom of the pit, which had been sunk into the sandstone rock, was 23 ft. below the grass level. The pit was evidently the earliest work on the site, as all the walls round it had sunk into it. The two walls which run eastwards from the easternmost of the three parallel walls at *a* had met the same fate as the others, but they were preserved further east under the pavement. The cap and part of the drum of a small freestone column (fig. 10, no. 6) and a wall tile, intended to keep the plaster off the wall so as to allow air or heat to circulate between it and the wall, were found in Room 21. The next room to the south, 22, was heated by a channelled hypocaust, and also had a mosaic pavement. Its east wall rests partly upon a threshold which formed an entrance to the house before the Rooms 21 and 22 were built. The threshold was formed of sandstone blocks, and was 9 ft. in width, with a pier or pillar in the middle. The hypocaust was stoked from a rectangular stokehole on the south, projecting slightly into Room 26, which must have been a mere wood shed, and the same may be said of Room 27 to the south again.

The coins found in House no. XV's range from the period of Postumus to that of Valens, with the exception of a second brass of Nero and two second brasses of Antoninus Pius found close to the west wall of Room 21. That the last-mentioned coins have no value as to date was shown by the discovery close to them of a second brass of Diocletian in good condition, and by the finding of the coin of Carausius in the pit under Room 21. A line of water-pipes was found to have existed on each side of the street to the east of House no. XV's; the line on the western edge lay 1 ft. 9 in. from the east wall of the house, and 2 ft. 9 in. to 3 ft. below grass level. Three pipe collars were found *in situ*, the first two 5 ft. 6 in. apart, and the third 26 ft. further to the south, the line having been disturbed by the later burial referred to below. On the east side of the street four pipe collars were found close to the eastern edge of the street drain, so that there were two lines of pipes in the street, or possibly the line may have crossed from the east to the west side, as the collars on the east side were to the north of those on the west. To the east of Room 3 the upper level of the road was found 2 ft. 3 in. below the modern grass level; there was a surface bed of mortar and concrete 2 in. thick, and then 1 ft. of gravel. Below this was an earlier road level, a well-

pitched surface on a level with the lowest of the steps which originally led out to the street.

A curious discovery was made in one of the rooms of House no. XV s, in which a huge piece of bone was found a couple of feet under the surface. This proved to be a portion of a femur of a large whale. Other portions of the same skeleton were found in House no. XVI s later, and fragments also were found, ten years ago, in House no. II s to the south. The femur measures in its largest circumference 3 ft. 9 in.; diameter from 9 to 15 in.

HOUSE NO. XVI s.

House no. XVI s occupies the north-west corner of the second *insula* from the west on the south side of the high-road. It lies to the east of House no. XV s, and on the opposite side of the street. What we have called one house is made up of several parts; there were originally three buildings with frontages to the main road, and narrow alley-ways between them (pl. LXII, fig. 1). These, like the similar buildings further east as well as those on the site of House no. XV s, were shops. The commercial quarter of the town was, as we should expect, situated along the high-road (cf. *Archaeologia*, lxii, pl. 1 for shops on the north side of it east of the forum), while the large dwelling-houses were in more remote parts. All had been much altered in Roman times, and the southern portion, at least, seems to have been converted so as to form one building. Over the Roman work there were remains of still later buildings, the date of which it was not possible to determine accurately, as no objects of post-Roman date were discovered. For convenience of description we have called the three buildings respectively the western, central, and eastern portions of House no. XVI s. Four periods may be distinguished in the history of these buildings, and they will be taken in chronological order.

First Period (fig. 11). The western portion consisted of one large room (1), measuring 22 ft. 6 in. from north to south, but its width was not determinable, as no trace of its west wall could be found. The main road was found just to the north of it; the surface was formed of small stones and gravel well rammed together. The road bed was 1 ft. 6 in. thick, and the width of the road was here considerable, the frontage line being set back very much more than in later times. This had indeed been the case with the whole row of buildings which have been excavated on the south side of the main road. The central portion was composed of four rooms (2-5); 2 and 3 on the north were small, while 4 and 5 were large rooms occupying the whole width of the block.

Room 4 was floored with a good brick concrete, some 4 ft. 3 in. below the grass level, which was only preserved in the south-west corner. The rest of the room was occupied by a group of furnaces, much destroyed and indefinite in

plan. Nothing was found to throw any light upon their origin or use. Room 5 had a floor of large old red sandstone *tesserae* on a bed of concrete $3\frac{1}{2}$ in. thick; this floor was at the same level as the concrete in the south-west angle of Room 4.

The eastern block consisted of a large room, 7 on plan, 69 ft. 6 in. long by 23 ft. 3 in. wide, which was apparently roofed, inasmuch as old red sandstone roofing-tiles were found scattered all over the floor level; in the north-east and south-west angles were small subdivisions (6 and 8), which were, no doubt, covered by the main roof of the block, as were also the two Rooms 9 and 9A to the south.

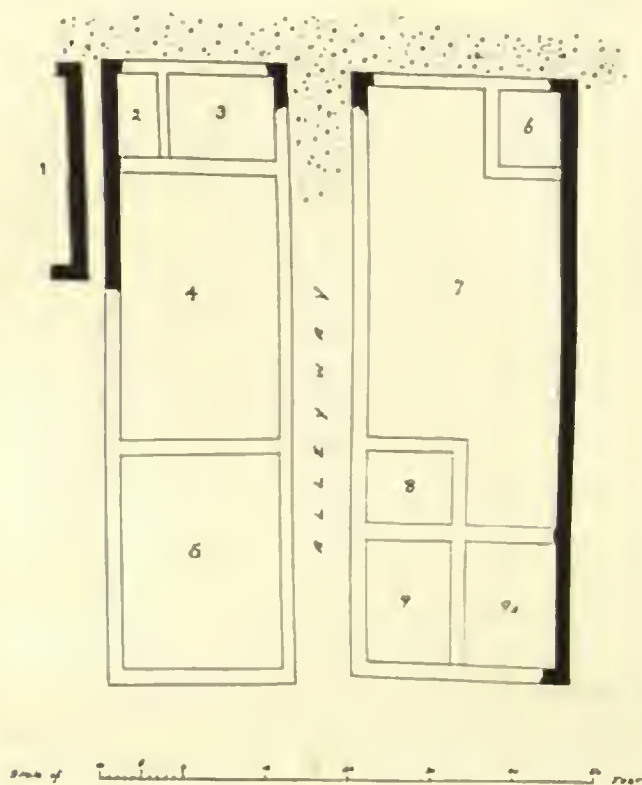


Fig. 11. House no. XVI s.: First Period.



Fig. 12. Large jar, House no. XVI s. About $\frac{1}{2}$.

A small iron tool, with a handle of red-deer horn, was found close to the south wall of Room 6. The front wall of the eastern block still had plaster *in situ* on the side towards the street. There was a skirting 11 in. high, white in colour, and above this were two coats of plaster, the first coloured red with much yellow splashing, the second $\frac{3}{4}$ in. thick, darker red in colour, with less yellow on it. This wall was continued eastwards and blocked the narrow space between the eastern block and House no. XVIII s. To the south of the eastern and central blocks was good hard pitching, 6 ft. from the grass level, made up of yellow sandstone blocks with gravel rammed between them, showing considerable signs of wear. Sunk in this pitching near the south-west corner of the eastern

block was a large grey jar, 18 in. high (fig. 12), ornamented with an incised wavy pattern; its rim was just above the pitching. Nothing was found in the jar, which was covered with a rough stone.

Second Period (fig. 13). No alterations seem to have been made in the western block; but shops (10-12) were placed in front of both the central and the eastern blocks, occupying the whole frontage of the buildings and encroaching considerably upon the street. The shops had entrances at the front and the sides. The

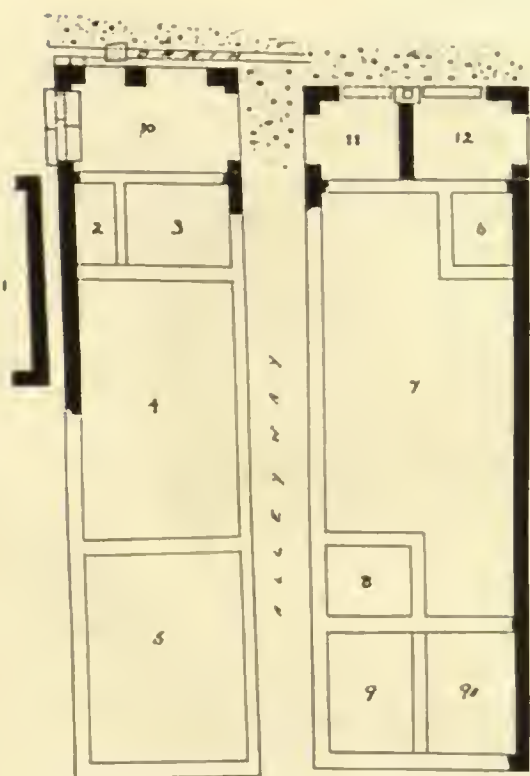


Fig. 13. House no. XVI s: Second Period.

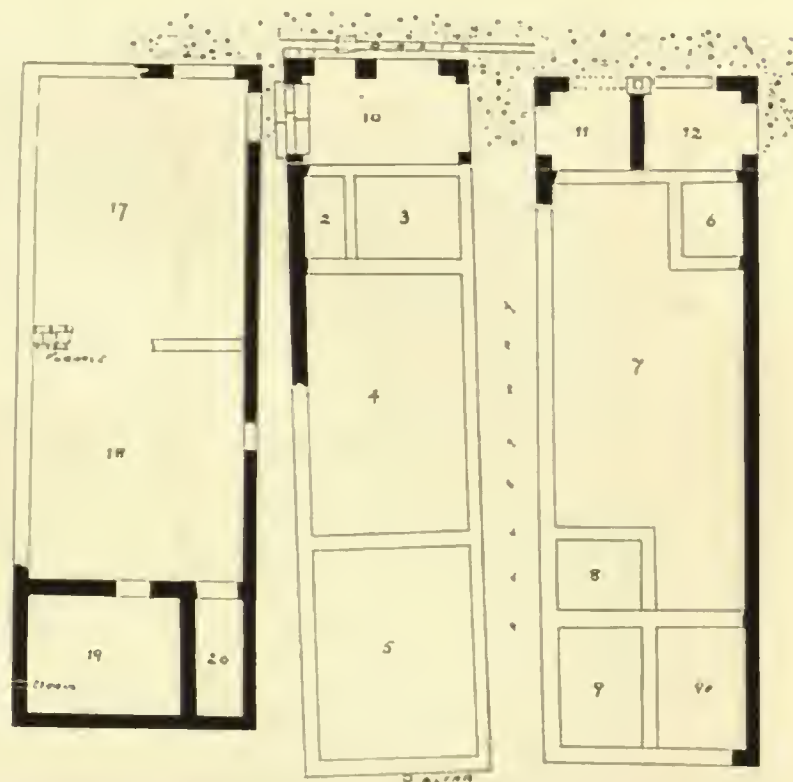


Fig. 14. House no. XVI s: Third Period.

one in front of the central block had a double opening towards the street, divided by a pillar in the centre, and giving a width of 5 ft. on the west and 7 ft. on the east. On the west was a flight of three well-worn steps of yellow sandstone, 9 ft. wide; the steps were 14 in. on the tread, and each had a rise of 6 in. The entrance on the east side was on the level, and was 8 ft. 6 in. wide. Very probably there was no entrance from the front, which may have been occupied by the woodwork of the shop front. In front of the eastern block there were two shops (11 and 12), entered from the front and the east and west sides respectively.

Room 12 had the front threshold stone *in situ*, with a large stone to the west of it which evidently carried the wooden post to which the doors of both shops were probably hung. The threshold stone was in one slab, 7 ft. long and 1 ft. 3 in. wide; on it was found a large iron key, which, from its pattern, may be mediaeval. Probably both rooms had similar thresholds, but that of Room 11 had been removed. The floor of the rooms, as preserved, was a rough gravel pitching at the level of the threshold. That these shops belong to the second, and not the first period, seems clear from the fact that they encroach upon the early frontage line, and also from the fact that the pillars on the south of their side entrances have not such good foundations, and are nowhere bonded into the front walls of the buildings; indeed, at the north-west angle of the central block the original quoins have been taken out and the pillar added, its line being an inch or two further west than the west wall of Room 3. We may probably assign to this period the earlier street drain which lies immediately to the north of the façade of the shops, and which follows the frontage line of all the other houses so far excavated on the south side of the main street. In the drain were found, besides a large quantity of common red and black pottery, fragments of Samian pottery, all of shape 33, bearing the following potters' marks:—

SEVERIAN . M

SATVRN

CELSIAN F.

Third Period (fig. 14). The western block was suppressed and superseded by a building similar to the other two blocks with a somewhat wider frontage. There were two rooms at the southern end of the block, 19 and 20, but the only other wall, which may have belonged to the third period, was the one to the north of the door into Room 18. This appears to have never gone right across the block, as there was a furnace close to the west wall in the line of the cross wall. At the point where this cross wall leaves the east wall of the block, we may note that the footing falls two courses to the south owing to the slope of the ground. The front of the block seems to have been used as a shop or shops, but all traces of the inner walls have been destroyed by the alterations of the fourth period. There was a doorway from Room 18 into the narrow alley to the east of it, the threshold stone of which was a block of yellow sandstone, with a groove 1 ft. 2 in. long close to its outer edge. Rooms 19 and 20 were accessible from Room 18, and in the south-east angle of the former was a pit partly underlying the walls of the house, and assignable to either the first or second period. In it was found, at 3 ft. down, a coin of Marcia Otacilia, A.D. 244-9, in good condition, with the reverse Pudicitia Aug. (Cohen 60), and at 4 ft. down a small black jar with the neck and handle broken off. The concrete floor of Room 20, as preserved, probably belongs to the fourth period, for below its level in the west wall of the room was a drain aperture 6 in. by 8 in., which had no connecting drain under

the floor. The drain was most probably destroyed when the floor was laid. The later street drain in front of the east block, overlying the earlier one, has to be assigned to this period, as the wall which cuts across it seems to belong to the fourth period. It was built of rough building stones with old red sandstone slabs at the bottom, and covered with rough slabs of stone, the drain being from 6 to 8 in. square. The construction of this building did away with the *raison d'être* of the steps on the west side of the shop (10) attached to the central block, and traces of a later floor of gravel resting on mortar and stones were found on a level with the top step leading into the doorway of the western block. The south portion of the top step had been removed and ordinary building stones put in its place. Under this level and all along the narrow space between the western and central blocks numerous fragments of pottery were found. Close to the steps was a plain Samian bowl (Dragendorff 31) with milled decoration round the interior of the bottom; the stamp was illegible. Further south a figured bowl (Dragendorff 37) was found, with the following decorations: Bear (Déchelette, ii. 817), Triton (*ibid.* 29), Centaur (like *ibid.* 434). Also the stamps /AILL F, MOXIVS M, and IIIIM from plain bowls whose form cannot be determined.

The central and eastern blocks underwent practically no modification in this period. To the south of the central block a small yellow sandstone altar bearing the inscription—

DEO
MARTI
OCELO
AEL·AGVS
TINVSOP
V·S·L·M

was found standing *in situ*, its back against the south wall of the block (pl. LIX, fig. 2). The sculptor seems to have made mistakes in spelling, the first v in AGVS being omitted in the fourth line, and an s had been cut in place of the v in the fifth line and afterwards altered. It is impossible to say whether the letters op in the fifth line stand for op(tio) or o(per) i(r)raefectus). The title OCELUS for Mars also occurs on the pedestal discovered in 1904,¹ and on an altar at Carlisle.² It appears as if this was the British equivalent of LEXUS, a title of Mars not uncommon on the Rhine. A coin of Tetricus and a worn first brass of Antoninus Pius were found close to the altar. Under the slab paving to the south of the altar a small toy lamp was found; it is exactly similar to those found in the forum in 1907 and 1909.³ The slabs belong to the period after the altar, as they were laid at such a level that the altar was buried by them.

¹ *Archaeologia*, vol. lix, p. 293, fig. 3.

² *Classical Review*, 1894, p. 228.

³ *Archaeologia*, vol. lxi, p. 582.

In either the second or third period the southern portion of the eastern block was reconstructed; the north and east walls of Room 9 were suppressed (and probably Room 8 also). A part of Room 9A was taken and Room 8A constructed. It had a dado of dark red plaster with yellow splashes, which began about 2 ft. above the level of the pitching alluded to above. A narrow room (8B), all that remained of Room 10, was left to the east of it.

Fourth Period. The rooms (13-17) in the northern portion of the western block were added at this time. All the rooms had pebble-concrete floors. Room 13 was accessible from Room 14, and also from the large space (18) which occupied the centre of the block. Whether Room 13 was a shop is doubtful, as its north wall was insufficiently preserved; but it is possible that Room 14 was used as such, the wide doorways being blocked up later. In the south-west angle of Room 13 a small black pear-shaped pot was found, containing six coins of Carausius and four of Allectus, all in mint condition.¹ Room 15 was accessible from the space 18, and also had a doorway into Room 16. That these rooms were an addition is clear from the fact that the south wall of Room 16 partly blocks the doorway in the east wall of the space 18, the doorway then being completely built up, and at this time the alley to the east went out of use. To the south of the block another room (21) was added in connexion with the changes which were made in the whole of the southern portion of these buildings.

¹ As coins of these two emperors of Britain are of special interest, some further account of this little hoard may be acceptable. They seem to have been but recently struck when deposited, and appear never to have been in circulation. Though several are of the *Pax Augusti* type, no two are exactly alike. They may be described as follows, the numbers quoted from Cohen being from his first edition:

CARAVSIUS. A.D. 287-93. Radiated bust to right, with paludimentum.

1. Cohen 164*. *Ob.* IMP. C. CARAVSIUS. P. AVG. (not IMP. CARAVSIUS as in Cohen). *Rv.* PAX. AVG. Peace to left, with olive branch and upright sceptre. In field S. P.
2. " 164*. The same, but details differ, and in exergue c (or G).
3. " 166. *Ob.* IMP. CARAVSIUS. P. F. AVG. *Rv.* Same as above, but no letters in field.
4. " 167. *Ob.* IMP. C. CARAVSIUS. P. F. AVG. *Rv.* Same as above, but S P in field.
5. " 187. *Ob.* The same. *Rv.* PAX. AVGGG. Peace to left, with transverse sceptre. In field S. P. In exergue MLXXI, London mint.
6. " 188*. *Ob.* IMP. C. CARAVSIUS. P. F. IN. AVG. (not P. F. I. AVG. as in Cohen). *Rv.* PAX. AVGGG. Peace to left, with upright sceptre. Partially silvered. In field S. P. In exergue c (or G).

ALLECTUS. A.D. 294-7. Radiated bust to right.

7. Cohen 33. *Ob.* IMP. C. ALLECTVS. P. F. AVG. *Rv.* PAX. AVG. Peace to left, holding olive branch and transverse sceptre. In field S. P. In exergue M. L. (London mint). Traces of silver plating.
8. " 33. The same, but c in exergue.
9. " 22. *Rv.* LAETITIA. AVG. Joy to left, holding a crown and anchor. In field S. P. In exergue c.
10. " 16*. IMP. C. ALLECTVS. P. AVG. *Rv.* FIDES. MILI. (not T). Faith to left, holding two military ensigns. In field S. P. In exergue c.

Turning to the central block, we find that the entrance to Room 14 in the western block having been suppressed, the door leading westwards from Room 10 shared the same fate. In fact, a new west wall was built for the whole of the northern part of the block, overlying and superseding the former one, and in connexion with it a new south wall to Room 10 was built. Rooms 2 and 3 were suppressed altogether, and the southern portion of them thrown into Room 4, which was now repaved with slabs of old red sandstone. The new south wall of Room 10 was carried as far as the east wall of the western block, thus blocking up the alley between this and the central block. Some large blocks of sandstone were laid in the alley-way to serve as a foundation for it. Room 4 received a further enlargement at the expense of Room 5, the north wall of the latter being suppressed, and a new wall constructed a little further south. The doorway in this wall had two blocks of sandstone for its threshold, and the stop for the door was formed, not out of the threshold stone itself as was usual, but by small stones set on edge in mortar. A square hearth was subsequently built in Room 4 in front of this doorway. The size of Room 5 was further diminished by the construction of two rooms, 22 and 23, over the southern portion of the central block, projecting also over the alley-ways to the east and west of it, and to the south of the south wall of the block, so as to align with the south wall of Room 21. To these must be added two other rooms (24 and 25), constructed at the expense of the southern portion of the eastern block; so that there was in the fourth period a range of five rooms on the south connecting the three blocks together. Two small rooms (26 and 27) were also formed to the north of 24 and 25. Of these rooms, 22 had a floor of old red sandstone slabs preserved over the earlier west wall of Room 5, and a concrete floor elsewhere; Room 23 also had an old red sandstone slab floor. In the other rooms no floors were preserved, and the walls were not standing high enough to show the positions of the doorways; Room 26, however, had a threshold leading into the eastern portion of Room 7. A wall was built to form a corridor (28) in the western portion of Room 7, and the north wall of this room was rebuilt a little further south. In the south-west angle of Room 7 the iron sheath of a wooden spade was found (pl. LXI, fig. 1).

We may perhaps assign to the same period the blocking of the openings into the shop 11, which can henceforth have been accessible only from Room 12; to the same period may belong the wall projecting north across the street. The rebuilding of the northern portion of the east wall of the eastern block was probably done at this time: large yellow sandstone blocks 1 ft. to 1 ft. 6 in. in thickness were laid right across the wall, projecting from 3 to 9 in. on each side of it; above these the wall was built with squared blocks of limestone of a larger size than was generally used in the ordinary walling.

Fifth or post-Roman Period. To this we may assign the various walls which

seem to intrude upon the Roman buildings and to bear no relation to their plan. Thus a rectangular chamber, measuring 25 ft. 6 in. by 12 ft., was constructed over the west wall of the western block, its west wall overlying the street drain and rendering it entirely useless. The entrance was towards the north, but this was blocked, at a still later period, by another building, in which we may note a doorway at A. A little further north were found two chamfered arch blocks, without doubt mediaeval. Further north, over Room 13, are two walls with a rounded angle towards the south-east. To the east again we meet with a later wall built across the eastern portion of the shop numbered 10, blocking it up almost entirely. There was, too, some later walling across Room 4, extending eastward over the alley-way, and another late wall is to be found running eastwards from the cross wall between the shops 11 and 12, and forming a rounded angle in front of House no. XVIII s.

HOUSE NO. XVII s.

Of this building there is hardly anything to be said, as it was almost entirely destroyed by late burials. It was situated on the east side of the street which runs between Houses nos. XV s and XVI s, to the south of the latter, and was separated from it by a yard. This yard was thoroughly trenched, but nothing of interest was found in it. The northern part of the house consisted of two rooms (1 and 2), the former of which was entered from the yard to the north by a doorway some 6 ft. in width, and the threshold stone was preserved just inside the room. Room 2 was probably accessible from Room 1. To the south of these rooms was another portion with a distinct north wall, but so much of it was destroyed that nothing could be made of it. It was not thought worth while to attempt to excavate it more completely, and by Viscount Tredegar's wish, in order to avoid disturbing these burials unnecessarily, no further work was done to the east of it with the exception of a trench along the west side of the churchyard wall, in which traces of two walls were discovered, so that the space to the south of Houses nos. XVIII s—XXI s as far as the street running east and west (which probably contained no buildings of great importance) was not investigated. It was evident that the whole of this area was occupied by a burial ground almost certainly of post-Roman date. The bodies had been buried from above after the Roman walls had been covered, for in many cases the walls had been completely taken out in the digging of the graves. The same thing happens to-day in the churchyard of Caerwent when graves have to be dug. The skeletons were all lying with the heads towards the west, and had been buried without coffins, and apparently without clothes or other objects, except that an iron spear-head was found close to one of the skeletons, and this is said by the British Museum authorities to be of a late-Celtic type. Some of the skulls have been

examined by Prof. Macalister, of Cambridge, who says that they are not Saxon, but of the later Romano-British type, all of one race, and like the skulls that are got from pre-Saxon or early Saxon times in places where the Saxon admixture is small or none.

HOUSE NO. XVIII s.

House no. XVIII s occupies a position fronting on the main street to the east of House no. XVI s, and separated from it by a space of 1 ft. 6 in. The frontage line of this house and the original frontage line of that next to the east is the same as that of the earliest period of House no. XVI s. In front of House no. XVIII s no shops had been added, but there were two bases, which evidently had carried columns or posts in line with the frontage line of the shops to the west, so that this house seems to have had a verandah similar to that of House no. XV s. Between the bases and the front wall of the house a rough hearth had been placed at a late date, and close by a quantity of iron slag was found. At 1 ft. 6 in. below the pitching, which formed the pavement here, was a hard bed of clinkers, and 1 ft. 6 in. below this a hard layer of rammed gravel 8 in. thick, in which were some fragments of Samian ware of shape 29.

The entrance to the house was in the north wall of Room 1, which from the remains of the furnaces found seems to have been used as a workshop. In this room were found two bars of lead 6 in. long, $1\frac{1}{2}$ in. wide, and $\frac{1}{2}$ in. thick, together with an ornamental piece, probably the lid of a box (fig. 15), and a circular piece 4 in. in diameter. A small iron tool with a handle of red-deer horn and an iron key were also found (pl. LXI, fig. 4, nos. 2 and 3). Room 1 had a later floor of rough pitching and slabs of old red sandstone over the remains of the furnaces, on which was found a coin of Valens. The threshold of the doorway from Room 1 into Room 2 had been displaced, and was found in the north-east angle of the latter room. The stone was 4 ft. by 1 ft. 6 in. by 6 in., and had a groove at each end. Two steps led down into Room 2, the floor of which was 14 in. below that of Room 1, and the second step had been formed out of part of the drum of a column. Close to the doorway on the west side of the room was a hearth 2 ft. 6 in. square, built of small red tiles, with similar tiles on edge as a border. In the south-west corner of the room was a furnace built of large blocks of stone; one of the outer blocks



Fig. 15. Ornamental lead panel from Room 1, House no. XVIII s. $\frac{1}{2}$.

at the east end was found to be moulded (fig. 10, no. 3). All trace of the doorway into Room 3 was gone, as this wall had been suppressed when the late furnace was built. In the north-west angle of Room 3 was an irregularly shaped pit, and the north wall of the room was partly built over it. Two feet from the grass level a second brass of Hadrian in good condition was found, and at 4 ft. down a silver coin of Vespasian and a bronze one of Gordianus Pius were found.

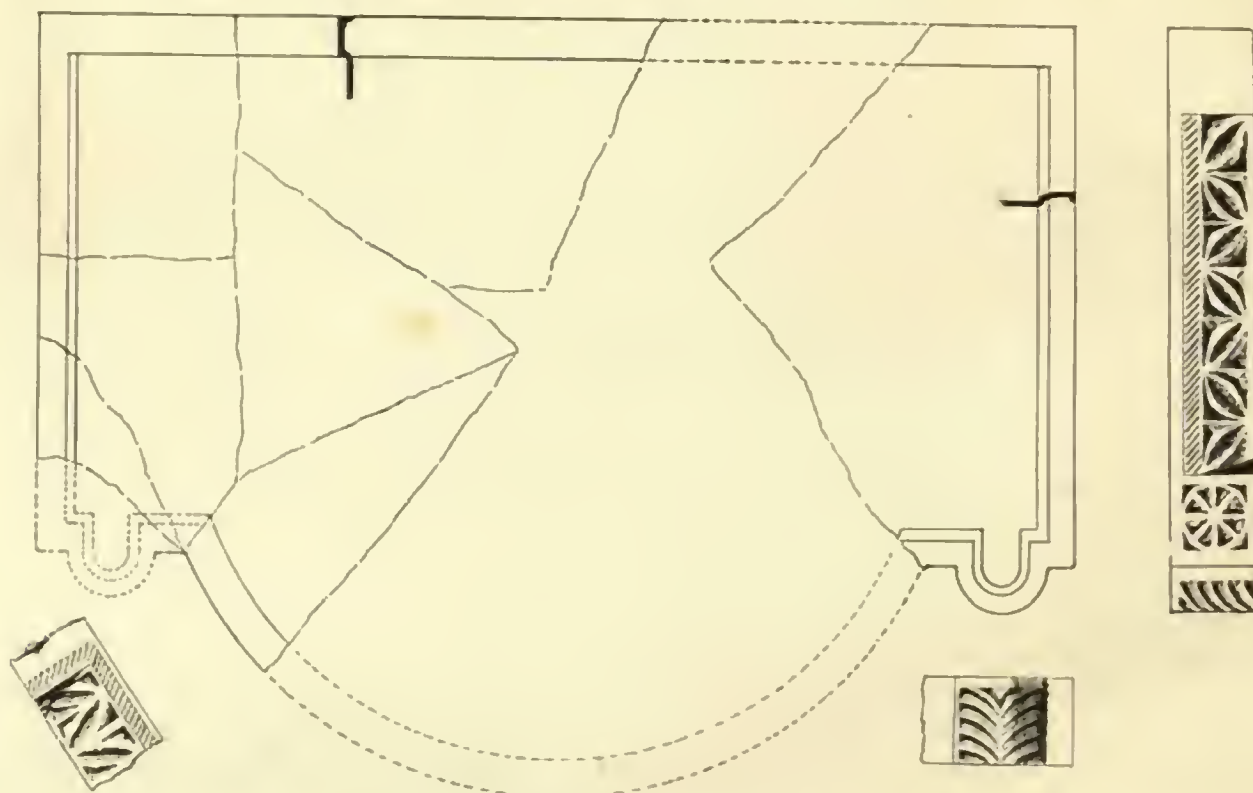


Fig. 16. House no. XVIII s: Carved slab. 1. F. K. del.

At this depth also was a black pear-shaped cinerary urn, covered with a roofing-tile and full of burnt bones. Just below this were two fragments of Samian ware; one of shape 33 with the mark CALETINI, and the other of shape 31 with the mark SACRILLI. M. At 8 ft. 6 in. down some fragments, making nearly half of a bowl of shape 37 (pl. LVIII, fig. 2), with the following decorations in metopes and panels, were found:

Apollo	Déchelette, ii. 52.
Bust of lioness	Not in Déchelette.
Man fighting a lion	Déchelette, ii. 624.
Cock	„ 1026 and 1038.
Baluster pillar	„ 1092.

The bottom of the pit, of hard natural gravel, was reached 10 ft. from the grass level.

Room 3 had a doorway in its east wall which led into the space to the south of House no. XX s. The threshold of the door was formed out of the drum of a column, and there were two steps down on to a pitched pavement outside. The south wall of Room 3 was too much destroyed to show where the door into Room 4 had been, and no trace of a door from Room 4 into Room 5 could be found. Several fragments of a carved slab of stone were found scattered over the north-east portion of the room about 2 ft. from the surface. There is 'chip' carving on the sides and semicircular front of the slab (fig. 16), while the top is dished. The straight joints in the walls in the north-west and south-west corners of Room 5 show this to be a later addition. It was entered by a doorway in its north-west corner, and in the south wall of the room the base and part of the drum of a column were used as building material (fig. 10, no. 2). No floor was preserved in the room.

HOUSE NO. XX s.

House no. XX s, to the east of House no. XVIII s, is very similar in plan. Originally its front wall was in the same line as that of House no. XVIII s, but later a room (1), perhaps a shop, was added encroaching over the street. Several alterations had been made in the house, and the only floors preserved were a few traces of old red sandstone slab-paving in the large room in the centre of the house, and some red tile-paving in the south-west corner of Room 9. The tiles measure $16\frac{1}{2}$ in. by $10\frac{1}{2}$ in. by $\frac{3}{8}$ in. thick, and lying on them was the top stone of a quern in perfect condition. Under the tiles several fragments of Samian ware of shape 37 were found, some of the pieces being from a very small figured bowl.

Room 1, which encroaches on the street, seems to have had wide doorways in its north and east walls; the one on the east side had been blocked up, and the west wall was too much destroyed to show any trace of an entrance. The front had a large threshold, which had been partly built over, and the quoin at the north-east angle of the building had a well-worked splayed plinth. In the south-east corner of Room 1 a black pear-shaped pot was found.

The doorway in the north wall of Room 2 had been half blocked up, probably when Room 1 was added; no trace of any entrance from Room 2 to the rest of the house could be found, nor was it possible to determine where the back portion was entered. Room 1 was probably a shop with a small store (Room 2) behind it. The central portion of the house, as found, was one large room having a small room (3) at the north, and two rooms (7 and 8) on the south opening out of it. The arrangement of this part of the house had, however, been very different at some earlier time. Room 5 had first of all been formed, and this had

been destroyed in the construction of Rooms 4 and 6, and these again were removed, leaving the building in the state in which we found it. An alteration had also taken place in Rooms 7 and 8, the division wall being pulled down and rebuilt a little further to the west. A small open hearth was preserved over Room 6, and in the south-west corner of the large central room and the north-east corner of Room 8 some white-coloured plaster was *in situ* on the wall. The furnace at the south-east corner of Room 3 must be of very late construction, as the quoin of the wall had been pulled down in building it. It was one of the usual type, of blocks of sandstone. Room 9 was first of all added, as shown



Fig. 17. Lead ring from Room 3, House no. XX s. 1.

by the straight joints in its east and west walls, and afterwards suppressed when the doorway into House no. XVIII s was made. The north wall of Room 9 runs as far as the west wall of House no. XVIII s, so that probably Rooms 3 and 4 of that house are late, while Room 5 was a still later addition. Very little pottery was found in the house, but in the central room two small altars were found: one, of old red sandstone, was complete, and measured 12 in. high, 6 in. wide, and 4 in. thick; the other was of yellow sandstone, broken and slightly larger—neither had any inscription. In this room, besides the lead ring (fig. 17), several perfect millstones and a large water-worn stone with an iron ring leaded into it, probably a weight, were found. The coins found included a first brass of Hadrian in good condition, 6 ft. deep and close to an early foundation; a silver coin of Julia Domna, with the reverse Pudicitia (Cohen 89), 3 ft. down on the west side of the large room; a worn second brass of Maximianus and several coins of the family of Constantine. Under the slabs in Room 3 some pottery was found, including some fragments of pot covers, and on the north side of Room 9, 6 ft. from the grass level, several fragments of Samian ware of shape 29 were found.

HOUSES NOS. XIX s AND XXI s.

Houses nos. XIX s and XXI s occupy the site of one large earlier building, a number of the walls of which could be traced under the floors of the later work.¹ In this case, perhaps it will be advisable to take the later buildings first.

House no. XIX s consisted of a courtyard, well paved with old red sandstone slabs, and bounded on the north, east, and south sides by the rooms of

¹ The early walls under House no. XX s may possibly have connected with those under Houses nos. XIX s and XXI s to form one large courtyard house, but we have no definite connexion between Houses nos. XX s and XXI s, and no fragments of coloured plaster or mosaic paving were found in House no. XX s.

the house, and on the west side by House no. XXI s. The paving of the courtyard was uneven and much broken up; it was only 2 ft. 6 in. below the grass surface. The rooms south of the courtyard seem to have been most important, and call for most description. Rooms 8, 9, 11, and 12¹ were apparently narrow corridors, and 8 and 11 at least were paved with slabs of old red sandstone, regularly laid. The paving of Room 11 had been repaired with roofing-tiles. The doorway from Room 9 to Room 11 was well preserved, as also was the north side of the door between Rooms 8 and 9. The central room (10) had a concrete floor, but the walls were too much destroyed to show the positions of the doorways. On the north side of the room an iron axe-head, with part of the wood shaft still in the socket, was found (pl. LXI, fig. 2, no. 2). In the south-east corner of Room 12 an iron spear-head, 22½ in. long and 2¼ in. wide, a small pair of iron shears (pl. LXI, fig. 4, no. 1), and a barbed arrow-head in perfect condition were found. In this room also three lead discs, 1½ in. in diameter, with holes in their centres were found. Just outside the south wall of Room 12, and 3 ft. down, was a fragment of a Samian pot of shape 33, with the mark ADVOCIS . M, and also a number of fragments of coloured plaster. At the east end of Room 9 several quarter-circle bricks were found, similar to those found built into the north wall of the nave of the basilica.² Very little can be said of the other rooms of the house, as all the walls were destroyed to foundation level. The threshold of the doorway between Rooms 6 and 7 was preserved, and it blocked up the stone gutter belonging to the earlier building. In Rooms 2, 3, and 4 there were small recesses in the walls, which had been carefully formed and plastered; the plaster had been coloured a bright yellow. At the south side of the courtyard, close to the north wall of Room 7, a quantity of iron slag was found, together with a ladle in which it had evidently been melted, as the pieces were all of the same shape. A large number of fragments of red baked tiles were found in and about the house; probably the building was roofed with these, and not with old red sandstone tiles.

House no. XXI s is similar in plan to House no. XX s, which it adjoins, but its front wall is in line with the latest frontage line of that house. The eastern rooms (3 and 6) are later additions, as shown by the straight joints in the walls. Built into the north-west angle of Room 1 was the base of a column, which probably was *in situ* and formed part of the verandah in front of the early building. On the east side of Room 1 the bronze arm of a balance was found 5 ft. from the surface. Room 2 had a doorway into Room 4, which in turn had

¹ It has been suggested by Prof. Haverfield that the block formed by these rooms may have been a small temple, similar to the one to the east of the forum, on the north side of the main road (*Archaeologia*, vol. lxii, pl. i).

² *Archaeologia*, vol. lxi, p. 573.

doorways into Rooms 3, 5, and 6. Room 5 was paved with fine brick concrete and had a small recess in its north wall. Excavation under the floor revealed another floor 2 ft. 6 in. below, and 4 ft. 6 in. below the grass level. On the east and west walls were remains of white-coloured plaster with black splashes on it. No plaster was preserved *above* the late floor, and only a few fragments of common black pottery were found between the floors. The small plan (fig. 18)

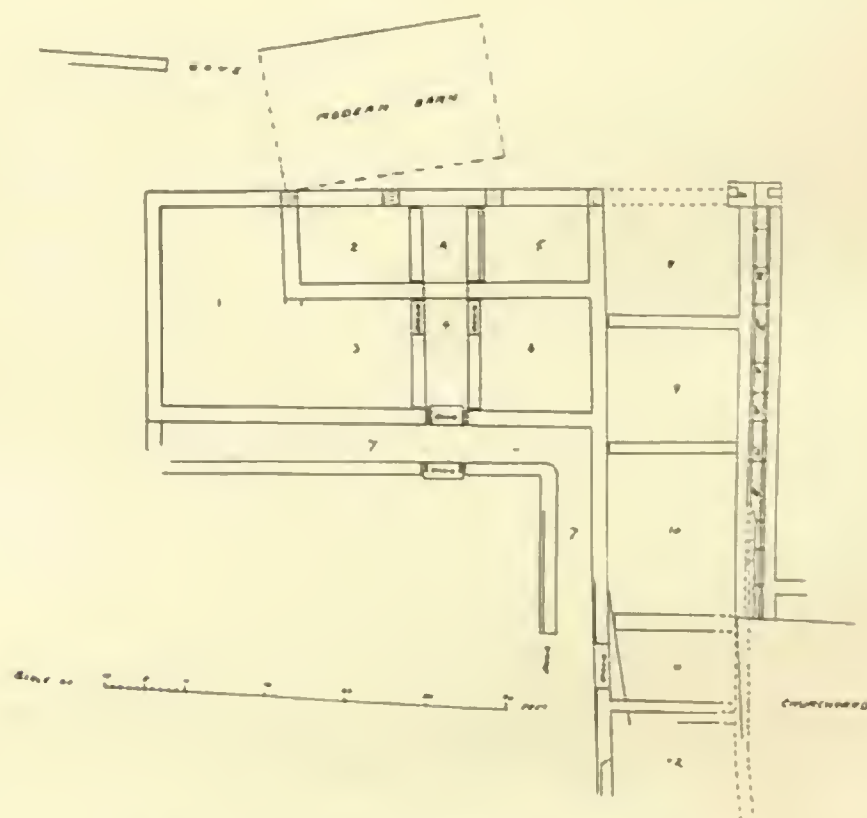


Fig. 18. Plan of earlier building, under House no. XIX.

shows the early building as far as we can reconstruct it. Two long corridors gave access to the rooms of the house, and its front wall followed the line of the fronts of the other early buildings in the field. None of the floors were preserved, but in the corridor (no. 4 on plan) a quantity of fragments of a very fine mosaic pavement were found, and throughout the layer of *débris*, just above the floor level, was a large quantity of finely coloured wall plaster. From the fragments found we gather that the walls had been divided into panels, and in these various draped figures had been painted. The floor level of the building was fixed by the two large threshold stones at the south end of the corridor, and

on this level a coin of Antoninus Pius with rayed crown, in mint condition, was found (Cohen 785, 1st ed.).

Along the north wall of the house was a series of bases at regular intervals. One better preserved than the others had a chamfered plinth with a square pilaster above it (fig. 19).

In the rooms to the east of the corridor no small objects were found, but amongst the débris which filled them was a large number of squared blocks of calcareous tufa, many with coloured plaster still adhering to them. Just to the east of these rooms and running under Rooms 6 and 7 of the later building was a fine stone gutter, which probably took the street drainage and the water from the eaves of the roofs to the garden at the back of the houses. Two large square blocks with square holes in them terminated the north end of it, and to the south it continued under the churchyard. Several of the blocks had been broken away so as to allow the walls of the later building to be erected.



Fig. 19.
House no. XXI s.: Base
with chamfered plinth. 3/8.

HOUSES NOS. XXII s, XXIII s.

House no. XXII s, to the east of House no. XIX s, was separated from it by the usual narrow space, and was very similar in plan to most of the others. We were unable to complete the excavation of this house, or the one to the east again, as the southern portions lie within the churchyard. Room 1 of this house was a later addition, and in it were found twenty coins of Valens 2 ft. from the surface. In the north wall of Room 2 was a circular column base built up of small stones and mortar, the first of the kind found at Caerwent. Some good columns of this construction have been found at Corbridge.

The street on the east side of this house is a continuation of the one from the north gate of the city, and as usual it was paved with stones and gravel rammed together. Along the east side was a footpath of large blocks of sandstone; these were at first taken to be the cover stones of a drain, but no trace of a drain could be found underneath them. No trace of water-pipes was found in the street.

House no. XXIII s had been enlarged at the expense of the street, Rooms 1 and 2 being built over it. The sandstone blocks had not been removed, and the south wall of Room 2 was carried over them by a semicircular arch. The arch, the paving of the street, and the walls of the house were all much out of position owing to the large sinkage that had taken place under this house and

House no. XXIV s (fig. 20). Here there had evidently been a natural hollow which had been filled up in early Roman times, for excavation to the bottom brought to light several fragments of Samian ware, Dragendorff shape 29.

House no. XXIII s, before its extension over the street, had an open verandah, the three bases of the columns of which were still *in situ* with square holes in them, and a small drain was found running under the north-west angle of Room 1. The building had been used as a workshop, and the three furnaces it contained



Fig. 20. Sinkage of street paving, arch and west wall of House no. XXIII s.

were all in a very bad condition. The space between Houses XXIII s and XXIV s had been used as a passage way, and was paved with blocks of sandstone; under one of them was a perfect upper stone of a quern. The little we could excavate of House no. XXIV s showed that it also had been fitted with furnaces, and a large one had been constructed at a later date over the street in front of it. Built into the walls of this furnace were a number of arch voussoirs of old red sandstone. They were all of the same size as those in the arch in the south wall of Room 2, House no. XXIII s. The construction of the street in front of these houses was as follows: At 1 ft. 6 in. below the grass

level was a layer of rough stones from 6 in. to 1 ft. in thickness; the surface was very uneven, and this must be taken as the latest state of the street, or more probably only as fallen building material lying upon it. A coin of Allectus was found on this level. Under the stones was a layer of mortar 4 to 5 in. thick, and under this was a hard even surface of gravel rammed together, and continuing to the north wall of the houses. The gravel had a total depth of 1 ft. 10 in., and had been put in in layers from 2 to 3 in. thick. Below the gravel was a foundation of large stones 9 in. to 1 ft. in thickness. In the sections cut only a few fragments of plain Samian ware and a few animal bones were found. The continuation of the drain found in the church path (*Archaeologia*, vol. lix, p. 122) was not discovered.



Fig. 21. Suggested restoration of finial.

The whole of the shops along the main street were probably roofed in the same manner, with a central ridge and gables at the north and south ends. This is substantiated by the finding of a finial (pl. LIX, fig. 1) in front of House no. XX s, and also of many roofing-tiles close to the east and west walls of the buildings, among which were some with square ends, which came from the eaves of the roof. The narrow space between the houses would then serve to carry away the water which would drop from the eaves. Fig. 21 shows a suggested restoration of the finial.

The whole of the roofs were constructed of stone; the tiles of old red sandstone, and the finials and ridges of freestone, which was probably quarried at Dundry, near Bristol. The tiles were secured with iron nails, many of which still remain in them; and the finials and ridge-pieces were kept in place by their shape and weight, and were fixed with mortar.

THE EXCAVATIONS IN THE VICARAGE ORCHARD.

By the kind permission of the Vicar of Caerwent, the Rev. W. Coleman Williams, we were able to excavate the garden and orchard attached to the vicarage. The vicarage is situated to the east of the city, about 60 yards from the east city wall, and on the south side of the main road. The garden, which lies to the south of the vicarage, was excavated without result, but the orchard, which is to the north-west, was found to contain a Roman building very similar in plan to the shops on the south side of the high-road (pl. LXIII). The north



Fig. 22. Stone coffin with skeleton found in Vicarage Orchard.

wall of the house had been entirely destroyed by the cutting of the modern main road, which is here several feet below the level of the Roman road, and nearly all the northern portion of the building had been disturbed by later burials, as in the case of House no. XVII s. One of the skeletons discovered was buried in a coffin built of slabs of old red sandstone (fig. 22), which had probably been taken from the floor of one of the rooms of the house. Altogether thirty skeletons were found both in and round the building. A coin of Victorinus and several illegible minims were found, but the only other finds of note were

the upper stone of a pair of millstones and a few fragments of black pottery. The whole of the orchard was examined, but no other walls were discovered.

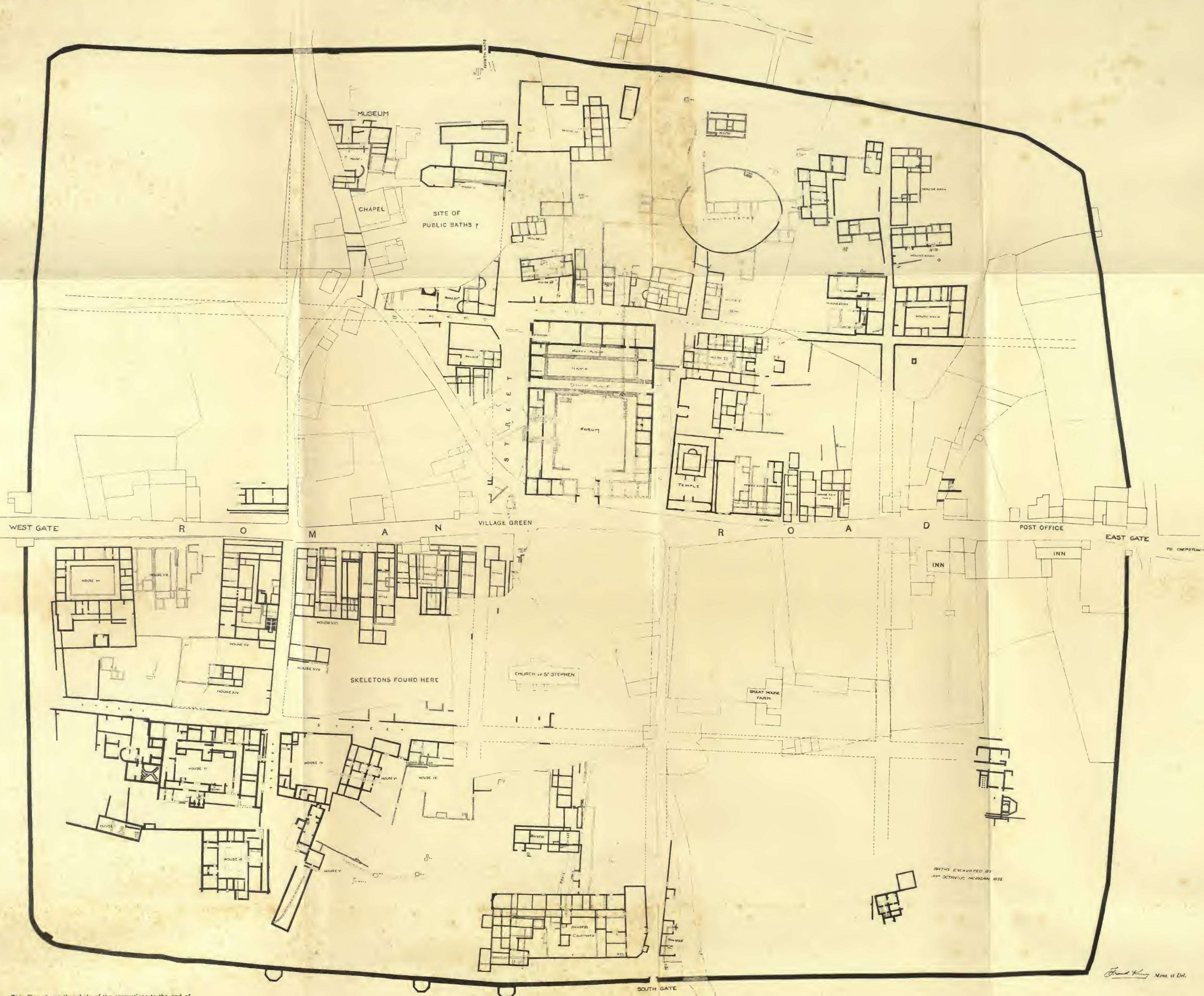
Pl. LXI, fig. 3, shows an iron plane which was found in House no. XII s in 1904, but which has not previously been illustrated.

Appendix on the Insect Remains. By ARTHUR H. LYELL, Esq., M.A., F.S.A.

Mr. C. O. Waterhouse, I.S.O., F.E.S., has been kind enough to examine the insect remains, consisting almost entirely of beetles, which have been found during the last ten years in soil taken from the Romano-British pits and wells on the sites of Silchester and Caerwent. About seventy species have been thus identified. Most of the determinations have been made from elytra. Some of the insects were identified by their heads alone, some from thorax and elytra, and in a few cases from head, thorax, and elytra. As one would expect, the majority are ground beetles, *Carabidae*; next to these are the various dung beetles, *Aphodius*, *Onthophagus*, *Geotrupes*, *Cercyon*, *Sphaeridium*, and *Histeridae*. There are numerous *Brachelytra*; three species of carcass beetles, *Necrophorus* and *Silpha*; and two water beetles, *Agabus* and *Hydrobius*. The furniture beetles, *Anobium*, would appear to have been a house pest even in Roman times, remains being found in six instances at Silchester, and in three localities at Caerwent. Wooden furniture is very rarely found on either site, only one turned leg of a stool or couch having come to light during the whole of the Silchester excavations; nevertheless, these beetles suggest that furniture did exist in Romano-British times in England, apart from any written history or evidence that may exist on other sites; but it is possible of course that the beetles may have been in the woodwork of the houses. As a whole, the species are such as one might expect to find now. There seem to be some differences in the sculpture of the elytra of a few of the beetles. The two specimens of *Pterostichus niger* from Caerwent differ slightly from modern examples, and the specimens of *Aphodii* also show differences which prevent the identification of the particular species. Mr. Waterhouse suggests the possibility of slight changes having taken place in our modern species since the Roman occupation, or that it is possible that some of those he has not been able to identify may be species not on our British list. From both Caerwent and Silchester the earwig, *Forficula*, occurs, also pupae of *Diptera*, and *Acari*, whereas Silchester can alone boast of the ant and a larva of a moth.

Insects	1904 House XIII N. well at 22' 2"	1904 House XIII N. well at 22' 9"	1904 House XIII N. well at 23' 10"	1905	1906	1908	1909 Bottom of well W. of House XXIV N.
COLEOPTERA							
GEODEPHAGA							
<i>Carabidae</i>							
<i>Nebria brevicollis</i> , <i>Fab.</i>			x	x			x
<i>Leistus fulvibarbis</i> , <i>Dej.</i>							x
<i>Cychrus rostratus</i> , <i>L.</i>					x		x
<i>Carabus catenulatus</i> , <i>Sc.</i>							x
<i>Pterostichus striola</i> , <i>F.</i>							x
" <i>niger</i> , <i>Ill.</i>		?			?		x
" <i>vulgaris</i> , <i>L.</i>			x	x	x		x
<i>Poecilus cupreus</i> , <i>L.</i>							x
<i>Amara</i> spp.		?	x	x	x		x
<i>Calathus cisteloides</i> , <i>Pz.</i>		?		x	x		x
<i>Clivina collaris</i> , <i>Hbst.</i>	x					x	
<i>Harpalus</i> (<i>puncticollis</i> , <i>Pl.?</i>)			x				
<i>Bembidium lampros</i> , <i>Hbst.</i>			x	x			x
" spp.		x	x				x
<i>Trechus minutus</i> , <i>F.</i>			x				
Various small <i>Carabidae</i>	x	x	x	x	x	x	x
BRACHELYTRA							
(<i>Tachinus</i> ?)							x
<i>Ocypus olens</i> , <i>Müll.</i>						x	
" <i>brunnipes</i> , <i>F.</i>					x		x
" <i>morio</i> , <i>Grav.</i>			x				
<i>Philonthus laminatus</i> , <i>St.</i>			x				
" (<i>aeneus</i> ?)						x	
" sp.		x					
<i>Othius fulvipennis</i> , <i>F.</i>							x
<i>Xantholinus linearis</i> , <i>Ol.</i>		x	x				x
" <i>punctulatus</i> , <i>Pk.</i>		x		x		x	
Remains of <i>Brachelytra</i>						x	
NECROPHAGA							
<i>Necrophorus humator</i> , <i>F.</i>							x
<i>Silpha tristis</i> , <i>Ill.</i>							x
" <i>atrata</i> , <i>L.</i>							x
CLAVICORNIA							
<i>Choleva</i> 3 or 4 spp.		x		x	x		x
<i>Hister</i> spp.							x
<i>Gnathoneus punctulatus</i> , <i>Th.</i>						x	
<i>Cercyon</i> 4 or 5 spp.	x	x	x	x	x	x	x
LAMELLICORNIA							
<i>Aphodius granarius</i> , <i>L.</i>				x		x	x
" 5 or 6 spp.			x	x	x		x
<i>Oxyomus porcatus</i> , <i>F.</i>		x		x	x		
<i>Geotrupes putridarius</i> and perhaps another species		x				x	

PLAN OF CAERWENT



This Plan shows the whole of the excavations to the end of the year 1910. The modern buildings are in outline.

	1904 House XIII s. well at 22' 2"	1904 House XIII s. well at 22' 9"	1904 House XIII s. well at 23' 10"	1905	1906	1908	1909 Bottom of well W. of House XXIV s.
SERRICORNIA <i>Elateridae.</i>							
<i>Athous vittatus, F.</i>					x		x
<i>Agriotes obscurus, L.</i>		x					
MALACODERMATA <i>Ptinidae.</i>							
<i>Anobium domesticum, L.</i>			x			x	
HETEROMERA							
<i>Blaps similis, Latr.</i>							x
RHYNCHOPHORA							
<i>Apion (aeneum)</i>						x	
" (<i>radiolus</i>)							x
<i>Sciaphilus muricatus, F.</i>					x		
(<i>Ombus</i>)					x	x	
<i>Rhinoncus</i>					x		x
Parts of various weevils				x		x	
ORTHOPTERA							
<i>Forficula</i>			x				
DIPTERA							
Numerous pupae		x			x		
ACARI							
One of the <i>Oribatidae</i>					x		

Appendix on the Vegetable Remains from Caerwent, 1909 and 1910.
 By ARTHUR H. LYELL, Esq., M.A., F.S.A.

A good many small sticks were obtained from the mud collected from the pits and wells explored at Caerwent during the excavations carried on in the summer of 1909. Most of the pieces were in the rough and fragmentary condition with the bark on; a few, however, had the appearance of having been cut or trimmed with some sharp instrument. Hazel, elder, and maple were the commonest, with a fewer number of sticks of oak, willow or poplar, birch, and ash. Five small pieces of wood, each about one inch long and less than half an inch in diameter, which came from the bottom of a well south of House no. XXIV s, showed in transverse section a two years' growth, having a very definite structure with a large pith cavity. Having failed to identify this specimen, I sent the pieces to Kew, with the result that the Director was good enough to send me the following report: 'The specimen from Caerwent is probably the stem of one of the Malvaceae. The structure of the stem shows considerable resemblance to that of *Lavatera arborea*, L., and it appears likely that the specimen may be a piece of the stem (*i. e.* either branch or main stem) of a species of *Lavatera*.'

The vegetable remains found in 1910 were very disappointing. A pit in House no. XV s, twenty feet in depth, and a deep hole between Houses nos. XXIII s and XXIV s were the only sites which contained anything of interest. The former yielded small pieces of charcoal of oak, holm oak, hazel, hornbeam, and willow or poplar, also a few charred seeds of wheat and small pea. In this pit also were some bones which Mr. E. T. Newton kindly examined and reports as follows: 'All the bones are (with few exceptions) in small fragments and quite indeterminable. None of them show any signs of having been gnawed or digested. A few have been burnt; but the greater part of them have not been subjected to any great heat. It is remarkable that these bones should be in such small fragments; but I am unable to suggest any cause for this. There is nothing to indicate that any of these remains are of human origin; and none of them belong to animals larger than a sheep, except one piece of tooth which I think is part of a small ox. The head of a femur may have belonged to a sheep. The golden plover seems to be represented by a coracoid bone, and there is also a single incisor tooth of a mouse and a scale of a fish.'

From the deep hole no seeds of plants were obtained, only some charcoal of oak, elder, and willow or poplar. It seems highly probable, seeing that most of the contents of these pits showed charred remains, that they were filled up with the sweepings of some hypocaust or hearth, together with a small mixture of unburnt bones.





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1. La Cotte de St. Brelade, before excavation. (Phot. G. Piquet.)
2. La Cotte de St. Brelade, after excavation, 1910. (Phot. E. Guiton.)
3. La Cotte de St. Owen, from the sea. (Phot. E. Guiton.)
4. St. Owen's Bay, Submerged Forest, as uncovered September, 1902. (Phot. J. Sinel.)
5. South Hill, High-level Raised Beach. (Phot. E. Guiton.)
6. Le Cané de la Rivière, Mid-level Raised Beach above Raised Sea-Cave. (Phot. E. Guiton.)

XX.—*Pleistocene Man in Jersey.* By R. R. MARETT, Esq., M.A., Reader in Social Anthropology, Oxford.

Read 23rd February, 1911.

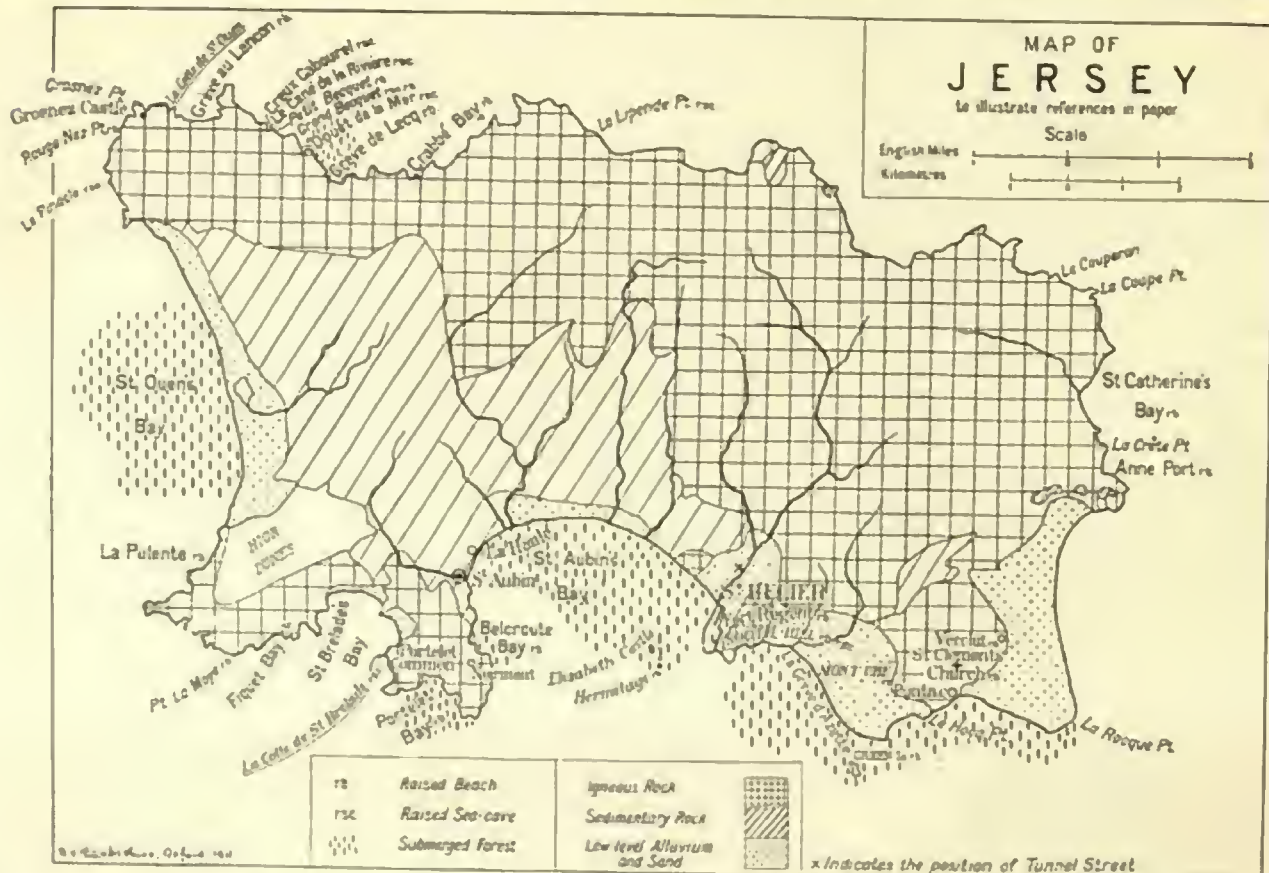
THE object of the following paper is threefold: first, to give some account of certain relics of pleistocene times, from a cave situated on the south coast of the island of Jersey; secondly, to notice the contents of another cave existing near the north-west corner of the same island, the horizon here being more uncertain, though not improbably pleistocene; and, thirdly, to discuss briefly the general relation of the pleistocene to the post-pleistocene traces of prehistoric man in Jersey in the light of the available evidence, whether archaeological or geological.

In what follows I am to be held entirely and solely responsible for all statements of fact, as also for all deductions therefrom. It is only right to say, however, that the first part of my task has been greatly facilitated by a clear and detailed report on the recent exploration of the first-named cave, as conducted under the auspices of the Société Jersiaise. This has appeared in *Man*, x. 102 (Dec. 1910),¹ above the signatures of Messrs. E. T. Nicolle and J. Sinel, who are respectively the Hon. Sec. of the Société Jersiaise and the Curator of its museum. Moreover, these gentlemen, as well as Dr. A. Dunlop, who has published valuable contributions to the later geological history of the island, and Mr. G. Piquet, who knows every inch of the Jersey coast, have allowed me to draw freely on their bountiful stores of local knowledge. Of the illustrations, two, showing an interesting implement worked on two faces, which comes from the second of the caves above mentioned and is now at Guernsey in the Lukis Museum, are due to the kindness of the Rev. G. E. Lee, Local Secretary for the Channel Islands to the Society of Antiquaries; three, representing specimens of my own finding, were prepared for me at the Pitt-Rivers Museum in Oxford under the experienced eye of the Curator, Mr. Henry Balfour; and the rest are mostly the fruit of the ingenuity and skill of Mr. E. Guiton, whose camera goes with him into slippery places, or else of Mr. Sinel, who has likewise lent a helping hand with several of the diagrams. I am also indebted for valuable information and assistance to M. Commont, M. l'Abbé Breuil, Prof. Sollas, Prof. A. Thomson, Prof. A. Keith, Dr. A. Smith Woodward, Dr. Andrews, Mr. Clement Reid, Mr. Reginald A. Smith, Mr. F. B. Pidduck, Mr. F. H. S. Knowles, and other kind friends.

¹ Reprinted, with four illustrative plates, in 36^e *Bulletin de la Société jersiaise*, 69 f.

A. LA COTTE DE ST. BRELADE.

The first of the two caves here in question I shall refer to under the title of *La Cotte de St. Brelade*, thus adding the name of the district in which it is situated to its vernacular designation, namely, *La Cotte*. I do this in order to avoid confusion with the second cave, *La Cotte à la Chèvre*, or, as I shall term it, again adding the name of the district, *La Cotte de St. Ouen*. It is perhaps worthy of passing mention that, in this word *cotte*, the dialects of the Channel Islands preserve the Scandinavian *kot*, as appears notably in the common phrase



for pigsty, *cotte à cochons*.¹ This survival is not surprising amongst a people who likewise call their farm-yard *bel*, and their stack-yard *ho-gard*, where we have simply the *bæli* and *hoy-gard-r* of Old Norse. Indeed, there is some evidence to show that this language was spoken in outlying parts of the islands as late at any rate as the eleventh century; for, as I am informed by my friend Mr. G. F. B. de Gruchy, Seigneur of Noirmont and proprietor of La Cotte de

¹ Cf. G. Métivier, *Dict. Franco-Normand*, Lond. 1870, s.v. *Cotte*, who suggests a Celtic derivation for the word. I am informed, however, by Sir John Rhys and Professor Anwyl that, in their opinion, the word *cwt*, meaning pigsty in Welsh, is not of Celtic origin, but is undoubtedly derived from the English 'cot'.

St. Brelade, a charter of about 1091 describes Jethou as the island *quae vulgo Keikhulm vocatur*.

The cave is situated on the south coast, in the cliff which bounds St. Brelade's Bay to the eastward. It is tucked away within a large cleft with perpendicular sides, which has been formed in the granite of the cliff-head by the erosion of an intrusive dyke of softer rock. This cleft is about 200 feet high and 40 feet wide, whilst it penetrates to a depth of some 150 feet. The rear wall would seem to be almost as sheer as the sides, but is masked by a steeply sloping talus of earthy matter interspersed with granite boulders of local origin, many being of great size. With its southern aspect, its two sheltering screens, and a difficulty of access which, under present conditions at all events, is very pronounced, this was a retreat that could hardly fail to attract inhabitants. The cave itself has been hollowed out, presumably by sea action during a time of greater submergence, at the landward end of the western side-wall, some 60 feet above the present mean-level of the sea. It is about 20 feet wide, and is 25 feet high as measured from the floor reached by the recent excavations, which may not, however, be exactly the true floor. As to the depth, further digging must determine its full extent, since only a comparatively shallow section of floor has been laid bare, whilst there is a receding cavity in the domed roof which possibly denotes a concealed interior having, say, another 30 feet of depth. Before it yielded to the spade, the cave was choked with firmly compacted débris, which rose flush with the entrance to within a few feet of the roof (plate LXV. 1). On the seaward side of the cave, however, a series of narrow fissures separated the intrusive rubble from the live rock, and suggested possibilities of excavation.

It was at the bottom of this row of fissures that, in 1881, Messrs. Dancaster and Saunders found flint chippings *in situ*, after being led to search there by accidentally lighting on a flint implement at the foot of the talus. Later on, in 1894, Mr. Colson and Dr. Chappuis made a small excavation at the same spot, and brought to light not a few worked flints, as well as a piece of bone breccia containing the tooth and the metatarsal of a horse. Thereupon, in 1905, the Société Jersiaise decided to explore the cave systematically, and, as before, the left-hand corner was made the point of attack. This work had soon to be abandoned, however, since it became clear that a more extensive opening was needed in view of the danger of falling stones. Not until July of last year (1910) was a clearing made of about 11 feet square, the result of three weeks' labour (plate LXV. 2); and here various members of the society had the satisfaction of unearthing the animal remains about to be described, as well as some hundred implements, all of which showed the same general facies, namely that of Le Moustier. I was myself unfortunately absent from the island at this stirring

moment, but, returning shortly after when the work was apparently suspended, did a little burrowing on my own account, the results being exhibited herewith. The very day after I was there a block weighing half a ton overwhelmed the place in which I had been searching. I was hardly surprised, therefore, to hear that the Société Jersiaise soon desisted from an attempt which they made in September to resume operations. The society, however, will certainly not be deterred, even by the considerable expense entailed by shoring-up the roof, from extorting the last ounce of treasure from this well-guarded strong-room.

The yield of objects of archaeological interest was confined to a layer of no great thickness overlying the floor reached by the present excavation. Interspersed with larger or smaller fragments of granite was a blackish soil of ashes mixed with clay. Here and there, however, it gave place to a whitish breccia signifying the presence of bone. Most of this was in a highly disintegrated condition. The clay of the island has strongly decalcifying qualities. Moreover, the series of fissures above mentioned supplied a conduit for such rain-water as found its way into the cave.

Some 8 feet back from the left side of the entrance were the remains of a hearth containing ashes in abundance. These ashes, by the way, yield on analysis a strong reaction for phosphates. Exactly the same thing occurred with ashes obtained by me from an Aurignacian hearth in the cave of Gargas, in the Department of Hautes-Pyrénées. Bone ashes in such quantity might be thought to indicate a scarcity of wood fuel. On the other hand, bone might well be used, even when wood was plentiful, on account of its property of slow combustion. Further, a convenient way of tidying up a hunter's cave would be to sweep the refuse into the fireplace.

My personal observations were confined to the wall of *débris* immediately in rear of this hearth. For two or three feet above the floor-level occasional worked flints, together with chips innumerable, were to be found lying at all angles, and obviously re-arranged by the more or less violent fall of intrusive rubbish, rather than covered up slowly and quietly as they lay. I have not noticed, however, any scratchings or striations on the smooth flint surfaces. The higher portions of the superincumbent mass were, as far as I could see, almost wholly sterile. It may be worth noticing, however, that here and there small fragments of flint occurred, though whether they belonged to the original influx of material must remain doubtful. Possibly in recent times explorers, having taken odd bits of flint from the lower fissures, dropped them on the top of the *débris*. This much at any rate is certain, that nothing has hitherto been found to suggest a subsequent tenancy of the cave by people of a distinct culture. Everything points to a single and homogeneous occupation.

A problem which has an important bearing on the geological history of Jersey

in pleistocene times is to account for the fact that these relics of Mousterian man are overlain with fifteen to twenty feet of angular rock rubbish imbedded in a matrix of clayey matter. The first question to be settled is how this rubble found its way into the cave. The report in *Man* supposes it to have taken place through a lateral thrust exerted by the talus masking the back of the ravine, dilapidation of the roof being likewise shown to have contributed its quota to the mass. It seems to me more likely, however, that the dome-like cavity in the roof represents the lower part of a blocked, and therefore concealed, chimney communicating with the upper surface of the cliff. Working its way down such a natural rubbish-shoot, an influx of material similar to that clothing the back of the ravine would inevitably assume the position lately occupied by the débris in the cave; whereas it is hard to conceive how any amount of lateral thrust could ever force the heavy drift so far inwards and even upwards. The presence of such a chimney, too, would help to account for the rotten state of the roof. I may add that a decidedly nerve-racking climb up the further side of the western wall will show that immediately behind and above the part of the cliff, some 50 feet thick or less, that is penetrated by the cave there is a thick patch of 'head', the lower end of which, jutting out into space, threatens at any moment to cut the verification short.

The second, and larger, question to be attacked is, under what conditions, and at what approximate period, did the rubble in the cave, and the neighbouring talus, come into being? I venture to suggest that the deposition of so considerable a quantity of rubble, in a site not favourable to its accumulation, could not possibly be ascribed to such subaerial waste as occurs to-day. Intense cold and excessive surface-denudation are surely implied. In other words, conditions verging on the glacial, with heavy snowfalls and very penetrating frosts, must be invoked. Certain it is, at least, that the present land-surface in the vicinity of the cliff is incapable of supplying any such fall of drift, since the head of the cliff stands as high as the neighbouring moorland, and is moreover cut off from it by a fairly deep depression. I conclude, then, that the talus in question is to be correlated with the peculiar formation occurring along the opposite coast of England, and known as 'Head'. That the Mousterian man occupied this cave at some time anterior to the Head-period, as it has been termed,¹ is a view quite in accordance with the place usually assigned to this period in the geological series.

Osteological remains of pleistocene fauna and of man constitute an important feature of this find. Although the bone discovered was in bad condition, enough

¹ By W. A. E. Ussher, *Quart. Journ. Geol. Soc.*, 1878, 449 f. I take it, however, that the so-called period merely stands for the latest and best-marked stage of a formation that may be of all ages subsequent to the pliocene.

of it retained some semblance of the original form to enable Dr. A. Smith Woodward, of the British Museum, working in conjunction with Dr. Andrews, to give us a fair idea of the fauna contemporary with the human denizens of the cave. When it is not otherwise stated, they regard the following determinations as certain :

(1) The Woolly Rhinoceros (*Rhinoceros tichorhinus*) is represented by part of a tooth, a left lower premolar, and probably also by a portion of bone not less than 6 inches in diameter and about 9 inches in length ;

(2) The Reindeer (*Rangifer tarandus*), by two teeth, last premolar and first molar, and by several portions of antler : it appears to have been a large variety, as large as the Caribou ;

(3) A small species of Horse, by upper cheek teeth, and a large species by parts of lower molars and by an upper cheek tooth ;

(4) A species of the smaller *Bovidae*, by lower teeth in a portion of jaw, by part of a horn-core, and probably by pelvic bones ; whilst there is also a left incisor tooth of *Bos* of uncertain species ;

(5) Another bone is probably the articulation of the fore-leg of some species of Deer.

From these identifications two deductions can be made with some confidence. The first is that we have here a pleistocene fauna characteristic of the steppe rather than of the tundra. The second is that when these animals were alive Jersey was connected with the Continent.¹ I give a sketch, constructed from the Admiralty chart, of what Jersey and its neighbourhood would look like at low tide if a general elevation of 60 feet were now to take place.²



Jersey elevated 60 feet, at low tide.

bourhood would look like at low tide if a general elevation of 60 feet were now to take place.² The presence of the reindeer is worth noting, since this animal has been thought by some authorities to make its first appearance in

¹ It is of course just conceivable that the animals crossed over to Jersey on a bridge of pack-ice ; or, again, that the Mousterian hunters, having made their kill on the Continent, carried back the spoil to their winter quarters over a more or less frozen sea. But the variety of the larder is all in favour of the view that the supply was both regular and close at hand.

² The similar map in R. A. Peacock, *Sinkings of Land* (1868), assumes an elevation of about 130 feet, the change thus effected in the appearance of the coast-line being, however, slight.

France in the course of the Mousterian period; though it has recently been shown, for Belgium at least, to be pre-Mousterian.¹ It may be added that in none of the Channel Islands have any traces of unquestionably pleistocene animals, such as the woolly rhinoceros and the reindeer, been hitherto discovered. A horse, apparently of the ordinary size, of which portions of the right humerus were, in 1873, found embedded in the loess, when the railway cutting at Pontac in Jersey was being made, is the only previous claimant to such distinction of which I know. Dr. Andrews, of the British Museum, who made the identification, informs me that there is nothing in the condition of the bone to forbid its being reckoned as pleistocene, but adds the warning that mere condition is no sufficient test of age in such a case, seeing how the degree of mineralization undergone by the specimen varies greatly according to the nature of the matrix and other circumstances. To return to the subject of the Cotte, it would in favourable circumstances have been interesting to search here for traces of the utilization of bones as implements. Such a practice was not unknown to the later Mousterians, as has been proved, for instance, by Dr. H. Martin at La Quina, in the Department of Charente. As it is, however, this criterion cannot be turned to account in determining the horizon of the Cotte, as all the bone hitherto discovered is in a wretchedly disintegrated state.

As regards osteological remains of man, nine teeth were found in a state of excellent preservation, though with their crowns much worn down by use; whilst a piece of bone which might be part of a human tibia was also brought to light. The fact of the occurrence of odd portions of the human anatomy in or near the refuse-heap accompanying a hearth might seem to some a damning proof that these cave-men were cannibals. After all, the Mousterians of Krapina in Croatia have been accused by their discoverer, Herr Gorjanović-Kramberger, of having held cannibal feasts in their rock-shelter, the proofs consisting in the numerous human bones lying about in a broken or burnt condition, though these, it would appear, are broken across, and never longitudinally, as is usually done with the marrow bones of food animals.² It may be added that the famous jaw of La Naulette looks as if it had been cracked in two with a hammer, and that we hear of other jaws that seem to have been demolished intentionally and are to be referred to the Mousterian period. M. Dupont has actually found what he considers to be traces of cannibalism in no less than thirteen Belgian caves occupied by pleistocene man.³ The Jersey evidence, however, is far too slight to afford a basis for

¹ A. Rutot, *Bull. Soc. belge de Géol.*, xxiv (1910), 75 and n.

² H. Breuil, *Les plus anciennes races humaines connues* (Fribourg, 1910), 52.

³ See A. Rutot, 'Le cannibalisme à l'époque des cavernes en Belgique,' *Bull. Soc. préhist. de France*, 1907, and compare his note, *Bull. de l'Acad. roy. de Belgique*, 1908, 525.

any such presumption. It may be worth adding that the teeth show no traces of the action of fire upon them.

In the report in *Man* it is stated: 'In one part of the most coherent bone mass had been the right half of a human lower jaw, nine teeth being ranged side by side in original position, but unfortunately no trace of the once supporting bone was apparent.' When the teeth were subjected to detailed examination, it soon became evident that this first impression could not be sustained. Mr. F. H. S. Knowles, of the Anatomy Department at Oxford, after measuring and identifying the separate teeth, proved them to belong to both sides of the upper and lower jaws of the same individual, in the order indicated in the accompanying photograph (plate LXX. 3) with which he has kindly supplied me. His measurements and determinations were afterwards checked, amplified, and confirmed by Professor A. Keith, Curator of the Museum of the Royal College of Surgeons. The latter has laid me under the deepest obligation by composing, from the comparative point of view, an elaborate study¹ of these interesting teeth, which he ascribes to an adult of twenty to thirty years of age. It is impossible here even to summarize conclusions based on a vast number of the most delicate observations. Suffice it to say that he regards *Homo Breladensis*² as one of the most, if not the most, primitive of the examples yet discovered of the Neanderthal type of man. It is especially in the characters of their roots that these human teeth represent, in his view, an extreme form of primitiveness. Their true affinity is with the teeth of *Homo Heidelbergensis*, who in respect of sheer age is probably by far the earliest man yet found in Europe, rather than with the teeth of the men of Krapina and Spy. The crowns are smaller than those of the Heidelberg mandible. The roots, however, are in most cases absolutely, and in other cases relatively, greater in their diameters, indicating a smaller but still more powerful mandible in the individual of the Cotte de St. Brelade—such a mandible, in fact, as, when plied with huge muscular strength, could cope with the tough food of the period. The following measurements thus have value as bearing at once on the distribution of the Neanderthal type and on the evolution that took place within that type itself.

¹ Published in *Journ. Anat. and Physiol.*, Oct., 1911. See also Professor Keith's summary account in *Nature*, May 25, 1911, p. 414, from which I extract most of what immediately follows.

² It is simplest to write *Breladensis*, from the modern St. Brelade, since there are endless ancient forms of the name as it occurs in Jersey and France (e. g. St. Breladre near Dol); see l'Abbé Manet ap. M. de la Croix, *Jersey: ses Antiquités* (1859), i. 200. Thus I find *Ecclesia Sancti Brolardi* in the *Extente de l'Ile de Jersey* of 1227, *Breuerlardi* in the *Livre Noir* of Coutances, 1278, *Broelurdi* in the *Extente* of 1331, as well as *Brouarlardii*, *Breunelardii*, *Breuelardi*, *Broaladrii* in the early Registers.

TEETH OF HOMO BRELADENSIS.

MEASUREMENTS IN MILLIMETRES.

	CROWN.			NECK.		TOTAL LENGTH.	
	proximo-distal.	labio-lingual.	maximum height	proximo-distal.	labio-lingual.	Actual.	Original.
1. MOLAR 1st upper right	11	12	5	9	12.4	15	20-25
2. PREMOLAR 2nd upper left	6.5?	10.5	6	6	11.2	19	22-23
3. MOLAR 2nd upper left	10.5	13	5.5	9.5	13.5	20	23-24
4. MOLAR 2nd lower right	12	11.5	5.5	10	10.5	19	20
5. INCISOR 2nd lower right	5.75	7	6.5	5	8	20.5	24
6. CANINE lower left	8	8	9	7	11	27	28
7. PREMOLAR 1st lower left	7.75	10	6	6.5	10	23.75	24-25
8. PREMOLAR 2nd lower left	7	9	7	6	8.5	21.75	22-23
9. MOLAR 2nd lower left	12	11.75	5	10	11	17.5	20-22

It remains to take stock of the implements discovered. Considering that the area of exploration has been relatively small, the cave has yielded a rich spoil of worked flints. Naturally the percentage of mere flakes without secondary chipping is high. After all, did not Mr. Roth watch Australian natives strike off 300 such flakes before obtaining one that proved passably suitable for a good knife?¹ Nevertheless, in digging (to speak only for myself) I could count on hitting on an implement of the best finish pretty well for each square foot of breccia that I painfully sifted out. Moreover, my spoil included at least three good examples of the so-called 'Mousterian point'.² The facies of these

¹ W. E. Roth, *North Queensland Ethnography: Bulletin*, no. vii, 16.

² M. Rutot, indeed, declares that one is lucky to find a single good specimen of the 'point' in 100 implements gathered from a Mousterian site. He explains this by supposing the Mousterian point to be the scraper that represents as it were the 'survival of the fittest', namely, one that has stood heavy use on both sides, with constant rechipping to revive the edge, until the well-known triangular form results. See *Bull. Soc. belge de Géol.*, xxiii (1909), 261.

dressed stones was extraordinarily uniform. Though my specimens are a mere third or fourth part of what the Société Jersiaise possesses, I doubt whether any but the slightest variations in the type are disclosed when one institutes comparisons on the wider basis. No flint, so far as I know, has been found in this cave showing secondary chipping on both faces. The single exception to this rule lies in the fact that the bulb of percussion is sometimes notched, thereby affording a better grip to the thumb; if indeed these notches be not mere undesigned *éraillures*. The material employed is as excellent in its own way as could be desired. The black flint, in particular, would lend itself to the last refinements of craftsmanship. The grey flint is also of good workable quality for the most part, though two of my specimens are made out of a rather coarse chert. Two implements are fashioned out of fine pieces of banded flint. To judge by the cores and other leavings, the raw material was obtained in the shape of rounded pebbles. The fact that the implements run rather small might possibly mean that this material was relatively hard to obtain.¹

The geographical source of these flints is an interesting problem. Nowhere in the islands is flint to be found *in situ*, though chalk occurs near the opposite coast of the Cotentin.² On the other hand, flint pebbles are to be found amongst the shingle of every beach in Jersey, though nowhere, I believe, in large numbers save at one spot, namely, between the neighbouring points known as La Coupe and Le Couperon, at the north-east corner of the island.³ It may well be, then, that the sea has eroded away, or now covers, beds of chalk a good deal more accessible to the pleistocene inhabitants of Jersey than the still existing chalk deposits of the Cotentin. On the other hand, if it be thought that the Jersey cave-man utilized pebbles from the beach, it would have to be postulated that, whilst Jersey was connected with the Continent, the general land-elevation was but slightly higher, so as to allow the sea to approach closely to what is now the island.

It remains to add that, apart from flints, various water-worn pieces of granite or other kind of local rock, all of which might well have been picked up on

¹ I owe this suggestion to M. Commont.

² If the flint came from still existing beds, the presence of banded flint in both Cottés might possibly afford a clue to the place of origin.

³ See D. Ansted and R. Latham, *The Channel Islands* (London, 1865), 293 [3rd ed. 1893], and C. Noury, *Géologie de Jersey* (Paris et Jersey, 1886), 131 n, who tries somewhat unconvincingly to explain the accumulation of flints in this locality by the prevailing set of the currents. It has been suggested to me that the fairly numerous flints of St. Aubin's Bay may come in part from the ejected ballast of ships. In the cutting below South Hill, however, Dr. Dunlop found a goodly proportion of well-rounded flint pebbles in a raised beach that must go back at least to the days of coracles (*Quart. Journ. Geol. Soc.*, 1893, 525). Flint pebbles are found deep down in the low-level clay of Guernsey: see G. Derrick, *Trans. Guerns. Soc. Nat. Sci.*, 1892, 215. Flints also occur in some of the low-level raised beaches of Alderney: see C. G. de la Mare, *ib.* 237.



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2

1, 2. Implements from La Cotte de St. Brelade. (Phot. H. Balfour.)

Published by the Society of Antiquaries of London, 1911

a beach, occur in the breccia. Whether introduced by man or not, these are certainly not of a piece with the superincumbent rubble which contains granite fragments having uniformly sharp edges. Some of these stones, as has been suggested in the report in *Man*, may have been employed for heating water in the manner still in vogue amongst certain savages. One round pebble of felspar (pl. LXVI. 2, 4th r. 4) has marks on it which might be the result of using it as a hammer, though it must be confessed that the dents appear to follow the natural cleavage planes. M. Commont suggests, by way of alternative, that it may be a sling-stone. A good-sized block of water-worn granite (180 by 125 by 60 mm.), with flattened upper and lower surfaces, shows a smooth patch, as if some vigorous rubbing had been done upon it.

Though hardly to be classed as implements, certain chalk fossils (echinoderms), at one time exhibited in the museum of the Société Jersiaise as part of the yield of the Cotte de St. Brelade, may be mentioned in this place, in order that their connexion with the cave may be called in question. They arrived with a batch of flint implements gathered in the early days of the exploration of this cave by Mr. R. Colson. It appears, however, that Mr. Colson has no recollection of having lighted on these fossils in this unlikely place—an experience that he would surely not forget. Moreover, he is ready to allow that he had similar fossils in his possession at the time, and that some of these might have accidentally found their way into the collection of flints. In 34^e *Bulletin Soc. jer.*, 445, Mr. Sinel deduces a land connexion with England from the presence of such fossils in the Cotte; but I understand from him that he is no longer disposed to count them amongst the authentic possessions of the Jersey cave-men.

The detailed descriptions that follow of typical implements from La Cotte de St. Brelade refer to plates LXVI and LXVII. Of these LXVI represents my own finds, LXVII the finds of others. All the originals are in the museum of the Société Jersiaise. Plate LXVII is from blocks lent me by the society. The description in each case begins at the top and proceeds from left to right. The measurements of length, breadth, and thickness are in millimetres.

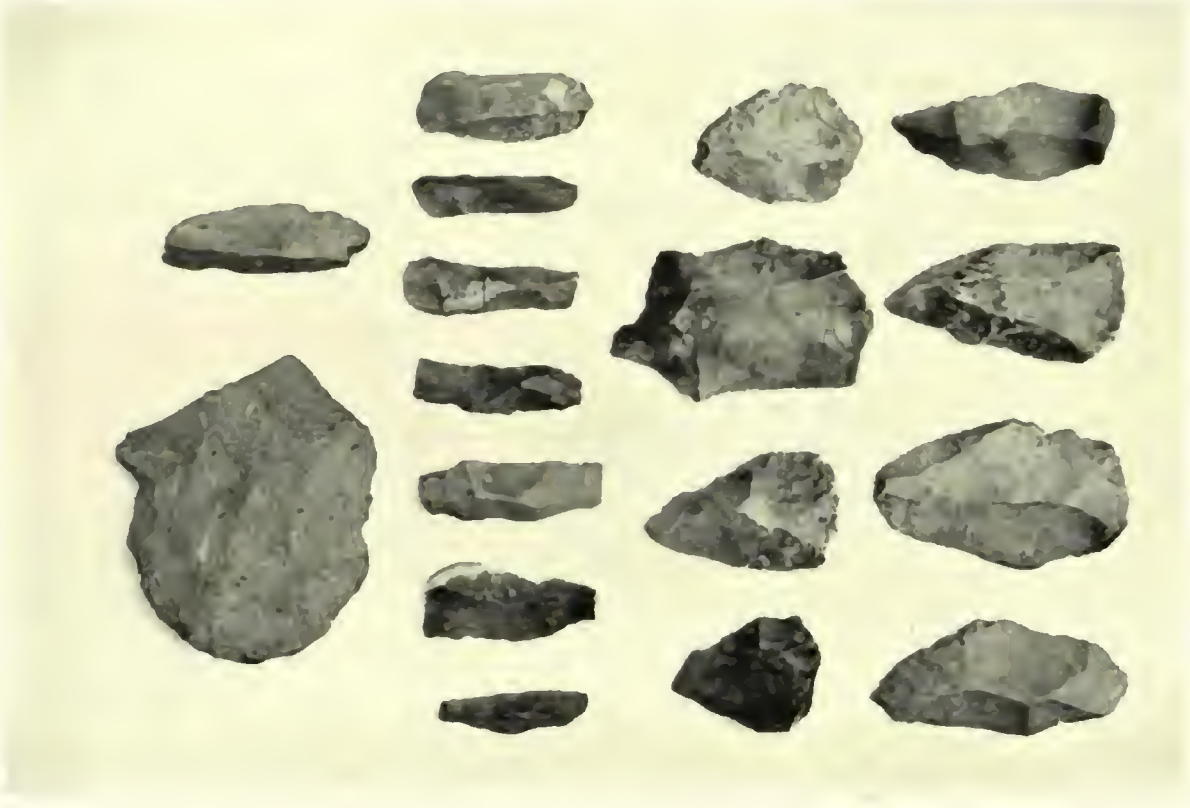
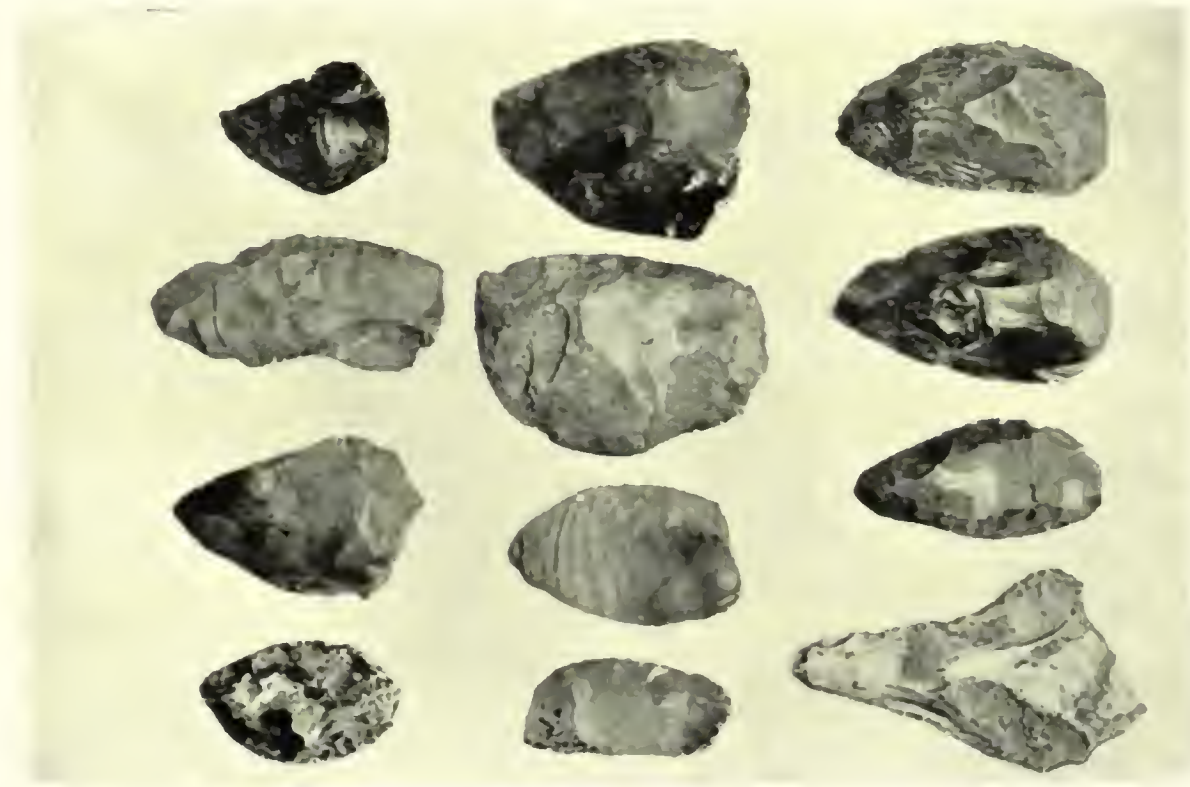
PLATE LXVI. 1.

- 1st row. (1) 58 × 34 × 14. Utilized flake of blackish-grey flint; some of crust retained on upper face.
 (2) 49 × 61 × 17. Broken scraper, fracture ancient, of blackish flint.
 (3) 65 × 40 × 18. Triangular scraper of grey flint with slight chipping on right side; retains some of crust near base; heel trimmed, and bulb slightly chipped to improve hold.
 (4) 62 × 31 × 6. Thin blade of grey flint, not utilized.
 (5) 59 × 26 × 10. Blade-scraper (*racloir sur lame*, M. Commont), of black flint, with rough chipping on right side.

- 2nd row. (1) $56 \times 45 \times 13$. Rough scraper of blackish-grey flint; represented with bulb uppermost.
- (2) $61 \times 29 \times 11$. Beautifully finished combined scraper (*racloir-grattoir*, M. Commont) of beautiful black flint, with fine chipping at base as well as along both sides up to the point.
- (3) $56 \times 31 \times 13$. Pointed scraper (*pointe-racloir*, M. Commont) of yellow-black flint; retains some of crust at heel.
- (4) $68 \times 36 \times 19$. Rough double scraper of black flint, with some of crust at point; bulb chipped.
- (5) $61 \times 38 \times 19$. Rough double scraper of black flint, with some of crust on right side.
- 3rd row. (1) $63 \times 46 \times 21$. Coarse scraper of blackish-grey flint, with some of crust on upper face.
- (2) $89 \times 43 \times 12$. Long scraper of blackish flint, with fine chipping on left side.
- (3) $67 \times 44 \times 14$. Beautiful pointed scraper (Mousterian point) of black flint, finely worked along both edges and trimmed at base.
- (4) $71 \times 45 \times 13$. Beautiful scraper of black flint, pointed, finely worked on right side, and trimmed at base; bulb deeply chipped to give good hold.
- (5) $67 \times 50 \times 11$. Beautiful pointed scraper of black flint, finely chipped all round; bulb slightly chipped.

PLATE LXVI. 2.

- 1st row. (1) $73 \times 58 \times 18$. Beautiful double scraper of grey flint, carefully worked all over upper face and neatly trimmed at base.
- (2) $60 \times 33 \times 12$. Scraper of grey flint, chipped mostly along right side, and broken on left side.
- (3) $59 \times 53 \times 16$. Notched plane (*coche-grattoir*, M. Commont) of grey flint.
- (4) $95 \times 51 \times 17$. Very beautiful double scraper of bluish-grey flint, covered with ferruginous incrustation from the clay.
- 2nd row. (1) $91 \times 70 \times 15$. Levallois flake, without secondary chipping, of grey flint.
- (2) $64 \times 42 \times 14$. Combined scraper; grey flint with slight chipping all round.
- (3) $81 \times 62 \times 18$. Single scraper (right side) of yellowish chert.
- (4) $63 \times 57 \times 20$. Rough discoid scraper of gritty chert, possibly a utilized nucleus.
- 3rd row. (1) $97 \times 32 \times 9$. Utilized blade of grey flint, retaining core along one side.
- 4th row. (1) $39 \times 35 \times 9$. Small disc of dark flint, possibly a utilized nucleus.
- (2) $67 \times 38 \times 9$. Scraper, with slight chipping, of banded flint (bluish-grey with white bands). A second instrument of the same banded flint was found in the Cotte de St. Brélade, and is in the museum of the Société Jersiaise.
- (3) $59 \times 44 \times 15$. Flake slightly utilized (if at all), showing curious blue patina, which extends over the bulb and lower surface, as if an old flake had after a long interval been rehandled.



1, 2. Implements from La Cotte de St. Brelade. (Phot. E. Guillon.)
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- (4) $54 \times 49 \times 29$. Felspar pebble, perhaps hammer (the dents on the surface may be due to this use, though they seem to coincide with the cleavage planes), or else a sling-stone (*bolas*).

PLATE LXVII. I.

- 1st row. (1) $75 \times 44 \times 15$. Beautiful ovate combined scraper, with chipping all round ; of grey marbled flint with patina and ferruginous stains. Found by Capt. Rybot in early days before the excavation, and probably exposed to atmospheric influences on the surface of the soil.
- (2) $95 \times 60 \times 26$. Double scraper of blackish-grey flint, with chipping mostly on right side, trimmed at base, and with bulb notched. Represented on obverse side.
- (3) $108 \times 47 \times 13$. Single scraper of grey flint, with coarse chipping on right side.
- (4) $64 \times 50 \times 15$. Single scraper of black flint, with slight chipping on right side, and trimmed at base.
- 2nd row. (1) $76 \times 35 \times 8$. Double scraper of grey flint, with slight coarse chipping, mostly on the right side. Some ferruginous deposit on upper surface.
- (2) $83 \times 52 \times 13$. Scraper of banded flint, with trimmed base and marks of use, but no secondary chipping. Represented on obverse side.
- (3) $109 \times 73 \times 15$. Levallois flake, with coarse chipping on right side and top of left side, and trimmed at base. Bluish-grey flint with yellow mottling, possibly a patina, this implement being one of those found by Mr. R. Colson in 1905.
- (4) $93 \times 71 \times 13$. Coarse single scraper of black flint, with chipping on right side, and a trimmed base which retains some of the core.
- 3rd row. (1) $125 \times 75 \times 20$. A pointed double scraper of a flint unlike that of which the other implements found here are made, being marbled white and grey. Longitudinal deep flaking, with fine chipping along right side. Some of the core showing on the left near the base. The implement protruded from the debris several feet above the floor, after the large stone had fallen which cut short my investigations in 1910. It seems to be of a different type from the rest.
- (2) $88 \times 45 \times 12$. Double scraper of brownish flint, somewhat patinated (found by Mr. Colson before excavation), with slight chipping along both sides, trimmed base, and notched bulb. There is a deep flaw across upper face.
- (3) $99 \times 57 \times 22$. Beautiful double scraper of blackish-grey flint with high polish, chipped along both sides and trimmed at base, and having bulb notched and under-side trimmed over the whole surface for 65 mm. from base. A little of the core left at base. Shows signs of use, edge being broken on right side.
- (4) $98 \times 55 \times 21$. Double scraper of blackish-grey flint, with coarse chipping on both sides and right across upper face.

PLATE LXVII. 2.

- 1st row. (1) $112 \times 94 \times 22$. Flake of dolorite, with ferruginous stains, chipped over upper face.
 (2) $75 \times 15 \times 8$. Flake of felsite (a rock occurring on north-eastern side of island), without secondary chipping.
- 2nd row. (1-7) Specimens of smaller flint flakes, without secondary chipping.
- 3rd row. (1) $54 \times 43 \times 12$. Flake of black flint, with trimmed base, but no other secondary chipping.
 (2) $70 \times 45 \times 15$. Double scraper of grey flint, chipped on both sides, base trimmed, bulb slightly notched.
 (3) $93 \times 56 \times 13$. Coarse irregular single scraper of grey flint, with chipping along right side, base trimmed.
 (4) $62 \times 45 \times 12$. Single scraper of grey flint, with chipping along right side, base trimmed.
- 4th row. (1) $92 \times 42 \times 11$. Single scraper of grey flint, with chipping along right side.
 (2) $90 \times 55 \times 51$. Utilized flake of grey flint, with trimmed base, but no other secondary chipping.
 (3) $86 \times 43 \times 11$. Same description as no. 1 of this row.
 (4) $78 \times 37 \times 13$. Same description as no. 2 of this row.¹

B. LA COTTE DE ST. OUEN.

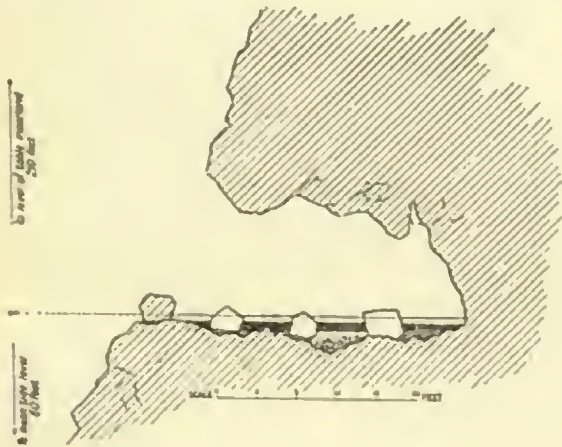
The cave is situated at the north-west corner of Jersey, not far from Grosnez Point (plate LXV. 3).² From the landward side it is completely hidden by the surrounding crags, which jut out from the face of weather-worn cliffs of granite, for the most part absolutely precipitous. It is for some way in from the entrance twelve to fifteen feet high, the breadth being much the same, and is about 33 feet deep. The accompanying plans, prepared for me by Mr. Sinel, will make further details as to its size and position unnecessary. It stands at about the same level above the sea as does the Cotte de St. Brelade, namely, at a height of some 60 feet above Ordnance Datum. Both caves, presumably, were eaten out by the waves during the same period of relative submergence, namely, that which is marked by the 70-foot raised beach discernible in several places round the island. According to Mr. Sinel, a member of the first exploring party, the original floor, which has now been considerably disturbed by digging, consisted of orange-coloured clay, followed a few inches down by pinkish clay, which in turn had china clay underneath it. It is in the lowest of these beds that the archaeological discoveries about to be described were made. The cave, though small, is conveniently shaped for human habitation, and is effectively roofed in and screened

¹ This plate gives examples of the coarser type of implement passing into the mere flake. On the specimens of the two lower rows M. Commont remarks generally: '*Éclats caractéristiques du Moustérien des limons du nord de la France.*'

² The cave is indicated by a white cross.

at the sides from wind and rain. It has, however, the great disadvantage, as compared with the Cotte de St. Brelade, of facing north. This would prove a serious matter if the climate tended towards the arctic.

In 1881 Messrs. Sinel and Dancaister, assisted by Mr. Hotton, of Guernsey, carried out a more or less thorough excavation of the cave. It was somewhat too readily assumed, however, that nothing further was left to the discoverer. In January of this year, on a day that proved the cave to be waterproof rather than windproof or warm, I plied the spade for some three hours, and, after some unsuccessful probing in places that had evidently been already searched, I hit on a largish stone sunk some 2 feet in the clay a little within the entrance to the right, which after repeated efforts I managed to dislodge. Underneath were the obvious remains of a hearth, namely, a foot's depth of ashes, with whitish bands in places showing that bone had once been there. Under the ashes



La Cotte de St. Ouen, Jersey : Vertical Section.



La Cotte de St. Ouen, Jersey : Horizontal Section.

was clay, and between this clay and bed-rock was a layer of very hard sand, presumably deposited at the time of the erosion of the cave by the sea. Over a hundred flint flakes were picked up by me within a narrow space. I came away with the impression that this site will bear a fuller investigation, and am glad to be able to say that the Société Jersiaise intends to take the matter up without delay.¹

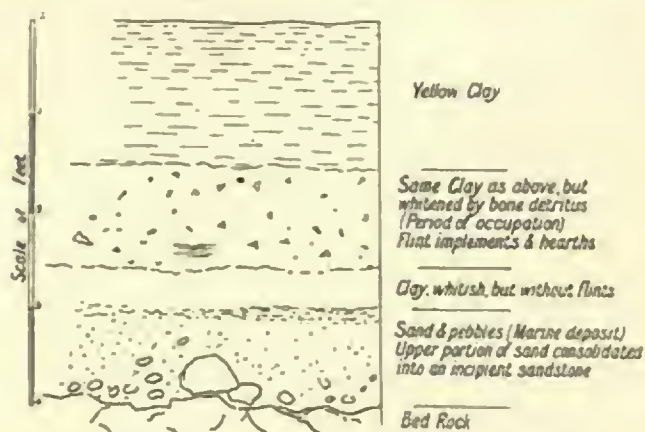
To deal first with the nature of the earthy matter found in this cave. The occurrence of layers, as marked by differences of colour and appearance, in the original floor has already been noted. It remains to inquire whether this clay

¹ This further exploration was carried out, under the superintendence of Messrs. Nicolle and Sinel, a week or two after this paper was read. A systematic search yielded few implements, but made clear the important fact that this is undoubtedly a sea-cave, having rounded pebbles as well as much hard sand for its lowest layer. Further, accurate plans were made of the shape of the cave; these the kindness of Mr. Sinel enables me to reproduce here.

is of local origin, namely, the product of the decomposition of the granite walls of the cave itself, or is an intrusive deposit, corresponding more or less to the rubble filling the Cotte de St. Brelade. The fact, first pointed out to me by Mr. Sinel, that in the roof of the Cotte de St. Ouen ribs of hard rock alternate with softer portions, which have decomposed away into hollows, makes it unnecessary, I think, to look beyond the limits of the cave itself for the source of the 3 feet of clay overlying the sand and pebbles—a veritable raised beach—occurring immediately above bed-rock. If this theory be accepted, one might go on plausibly to argue, on the somewhat risky assumption of a uniform rate of rock-decomposition, that, since the Mousterian floor would seem on an average to have only about six inches of clay underneath it, as against five times as much above it, the formation of the cave itself roughly antedates the

Mousterian occupation by an interval which needs to be multiplied by six to carry us from the beginning up to the present day.

As regards osteological remains, the explorers of 1881 found, in the last stage of decay, the lower jaw of a large deer, of undetermined species; but, though, as I have said, traces of bone waste are not wanting, nothing else has hitherto come to light that can be definitely referred to the anatomy of man or any other animal.



La Cotte de St. Ouen, Jersey Section of Floor.

Of the implements found in this cave in 1881, some, but by no means all, have found their way into the museum of the Société Jersiaise. Perhaps the most interesting (pl. LXIX. 2, 3) was secured by Mr. Hotton, a visitor from Guernsey, who carried it off in order to present it to Dr. Lukis, the eponymous hero of the well-known museum of that island, wherein it is to be seen at the present day. It is of grey flint, and measures 76 by 57 by 54 mm. By its size it might well be Mousterian, and the fact that it is chipped on both faces is in no wise fatal to such a determination. Judging simply from my description of it, M. l'Abbé Breuil identifies it with the *coup-de-poing cordiforme* of the Lower Mousterian. This heart-shaped outline is not peculiar to it, being common also to three other implements, with trimmed base and showing marks of use, which come from this cave. Flakes with secondary chipping upon them were extremely rare. Of unworked flakes, on the other hand, the greater number discovered in 1881 proved to be rather small, thin blades, and it was thought that this pointed to skin-dressing as a leading industry of the cave-folk.

Mr. Sinel speaks of their having found ashes near the further end of the cave, so that it would seem to be a different hearth from the one which I disinterred near the entrance. A lump of iron pyrites, apparently a strike-a-light, was found by them at the same time.

Of my own finds (pl. LXVIII. 1), the best is a large Levallois flake, with coarse secondary chipping not only on one side but likewise on the other in the vicinity of the bulb. M. Commont, judging from the photograph, compares it with the implement, assigned by him to the Lower Mousterian, which is figured in his valuable study of the Mousterian industry in the North of France.¹ There is also a good Levallois flake showing signs of use, and with the base consisting of a number of facets—a characteristic which convinces M. Commont that this industry is Mousterian rather than Acheulean. One implement, described by M. Commont as a scraper-saw, was obtained by me, not with the rest, but hidden away in a deep crevice near the roof of the cave, with a good thickness of cave-earth above it. A granite pebble found in the hearth, measuring 85 by 70 by 48 mm., has a smooth patch upon it, showing that it has been used for grinding or polishing. It remains to add that my observations hardly bore out the view of the former explorers that the flakes on the whole ran small. I secured quite a large number of coarse flakes of fair size, and apparently in many cases showing marks of use, though without secondary chipping. Indeed, the white flint, of which they are mostly composed, appears to me to be of comparatively poor quality, and hardly such as to lend itself to delicate manufacture, as does the black or grey flint of the other cave.

A question on which other opinions may possibly disagree with mine is whether the implements from the Cotte de St. Ouen are Mousterian, as those from the Cotte de St. Brelade undoubtedly are. M. Commont, judging simply from the photographs, believes them to be typically Mousterian, and points out that they correspond in all points to the industry described by him in the paper already cited. In the flint worked on both faces he finds nothing exceptional. It is an example of a type that persisted into Mousterian times, though the Mousterian implements, as compared with the Acheulean, are smaller, if not necessarily of poorer finish.

If such a determination be accepted, the further question arises, Are these two Jersey sites contemporaneous, or, if not, which is the earlier of the two? That the two industries are on the face of them distinct will, I think, be allowed. The style, the very material, is markedly divergent. The two workshops—for such they may truly be termed, in view of the multitude of cores and oddments

¹ *L'Industrie moustérienne dans la région du Nord de la France*, 5^e Congrès préhist. de France, Session de Beauvais, 1909, p. 128, fig. 15.

with which they are severally littered—were at any rate quite independent of each other. But do they belong to different epochs? Until further exploration provides us, as I hope it may, with a wider basis of induction, I am inclined provisionally to regard the industry of the Cotte de St. Ouen as at least slightly the older of the two. I base this view mainly on the analogies provided by M. Commont's series from the North of France.¹ It may be just worth adding that, if, as is generally held, the climate was gradually growing colder during the Mousterian period,² the Cotte de St. Ouen would become unpleasant as a winter resort long before the Cotte de St. Brelade, with its sheltered situation and southern aspect. Apart from the morphology of the implements, however, there is at present little or nothing to build on.

The detailed descriptions that follow refer to plate LXVIII. 1, 2, of which the upper portion represents my own finds, the lower the finds of others. All the figured specimens are in the museum of the Société Jersiaise, where many cores and unworked flakes are also to be seen. The order of description and scale of measurement are as before.

PLATE LXVIII. 1.

- 1st row. (1) 73 × 27 × 8. Unutilized blade of black flint, which is comparatively rare in this cave.
 (2) 79 × 34 × 16. Thickish blade, probably utilized, of grey flint.
 (3) 88 × 70 × 19. Utilized Levallois flake, of the white flint characteristic of this cave, with the base worked along several planes.
 (4) 118 × 93 × 20. A fine Levallois flake of black flint coarsely chipped on upper face, and also below, on and near the bulb.
- 2nd row. (1) 40 × 35 × 12. Fragment of banded flint, such as also occurs rarely in La Cotte de St. Brelade.
 (2) 53 × 29 × 12. ditto.
- 3rd row. (1) 191 × 65 × 21. A rough thick scraper, slightly chipped along one side, of black flint; represented with bulb uppermost.
 (2) 72 × 62 × 16. Utilized flake of white flint; scraper or knife.
 (3) 96 × 53 × 23. Utilized flake of whitish flint (*racloir-scie*, M. Commont), with some of core near base; found by itself in a cranny of the roof under much cave-earth.
 (4) 74 × 47 × 14. Coarse single scraper of grey flint.

¹ I am glad to say that, after having independently come to this opinion on the strength of the French parallels, I ascertained that M. Commont himself, and another great authority, M. l'Abbé Breuil, were inclined to place the two industries in the same order. It is only fair to them, however, to state that they did not have an opportunity of actually handling any specimens, but judged merely from my photographs and descriptions.

² Thus M. l'Abbé Breuil informs me in a letter that he finds the bison grow rarer and the mammoth more common in France as the Mousterian period advances.



1



2

1 (Phot. H. Balfour), 2 (Phot. J. Sineh). Implements from La Cotte de St. Ouen.

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PLATE LXVIII. 2.

- 1st row. (1) $56 \times 39 \times 14$. Double scraper of black flint ('Mousterian point') with chipping along both sides and bulb notched; core showing on left side of base.
- (2) $58 \times 38 \times 9$. Single scraper of blackish-grey flint, chipped along left side, and with trimmed base.
- (3) $37 \times 35 \times 13$. Mousterian disc of blackish flint with heavy chipping and notched underneath.
- (4) $80 \times 36 \times 24$. Double scraper of blackish-grey flint, more or less quadrangular, with trimmed base.
- 2nd row. (1) $76 \times 56 \times 12$. Flake of white flint, utilized on left side.
- (2) $103 \times 81 \times 25$. Heart-shaped Levallois flake of greyish-white flint, trimmed base, and showing marks of use.
- (3) $102 \times 39 \times 10$. Flake (saw) of greyish-white flint, serrated along right edge.
- (4) $81 \times 50 \times 13$. Coarse single scraper of grey flint, chipped on left side, but showing marks of use along right edge, with base trimmed.
- 3rd row. (1) $70 \times 47 \times 14$. Utilized flake of grey flint.
- (2) $55 \times 54 \times 20$. Heart-shaped flake of black flint, showing marks of use, with thick trimmed base.
- (3) $58 \times 56 \times 19$. Heart-shaped flake of grey flint, showing marks of use, with thick trimmed base.
- (4) $61 \times 50 \times 14$. Flake of banded flint, showing marks of use, with thick trimmed base.

C. RELATION OF THE PLEISTOCENE TO THE POST-PLEISTOCENE TRACES OF PREHISTORIC MAN IN JERSEY.

Reasons of space make it necessary to attempt no more here than to provide certain heads under which a discussion of this interesting question might be conducted. The following order of topics will be adopted. First, the nature of the evidence will be summarily reviewed, according as it is merely archaeological, merely geological, or of a kind that permits some correlation to be established between archaeological and geological considerations. Secondly, a provisional series of periods will be constructed in order to assign the foregoing fragments of evidence to their various probable or possible horizons.

Archaeological Evidence.—In this category have to be noticed various implements of a seemingly palaeolithic facies which are exhibited in the museum of the Société Jersiaise. One set has there been tentatively classed as Chellean and another as Mousterian. (1) To me, I must confess, the Chellean character of the former group is far from clear. None of them shows any close analogy

with the classical types. (2) Some of the group classified as Mousterian, on the other hand, tend to show a discoid shape that is at least consonant with such an attribution.¹ Two of these implements, worked on both sides, bear some resemblance to the heart-shaped *coup-de-poing* from the Cotte de St. Ouen which is now in the Lukis Museum. The majority of these specimens of either class come from high moorland round the coast. Here the granite is usually overlain by no more than a foot or two of peaty soil, whilst in places the rock surface is exposed to the air. On one of these barer patches near Grosnez I found a neolithic axe-head of sandstone, and what I take for a good example of a Mousterian scraper of blackish flint, within a yard of each other, the specimens being now in the museum of the Société Jersiaise. For the rest, I would remark that frequent flint flakes and cores occur on the high moorland in the immediate vicinity of both Cottés, notably in a field bordering on Portelet Common, and at the sides of the rough track that leads to the ruins of Grosnez Castle. I add detailed descriptions of some of the most interesting of these sporadic implements, figured in plate LXIX, realizing full well that the classification of isolated specimens is always a matter of the greatest uncertainty.

PLATE LXIX. 1.

- 1st row. (1) $78 \times 64 \times 26$. Discoid *coup-de-poing*, or possibly a utilized nucleus ('disc'), of white flint, with strong chipping over both surfaces, and trimmed base. Found June 1892 at La Crête Point, east coast, on the beach at high-tide level (having perhaps fallen from the neighbouring bank).
- (2) $41 \times 35 \times 1$. Disc of blackish flint trimmed all round, and showing remains of core.
- (3) $53 \times 53 \times 21$. Fine disc of blackish flint trimmed carefully all round, and showing remains of core.
- 2nd row. (1) $65 \times 56 \times 22$. Discoid *coup-de-poing* of white flint, with strong chipping over both surfaces, and trimmed base. Found Oct. 1897 by Mr. G. R. Cable built into the wall of a house at La Moye, doubtless as a charm against lightning, such a flint implement being known locally as a *coin de foudre* (for parallels see illustrative case, Pitt-Rivers Museum, Oxford).
- (2) $49 \times 28 \times 22$. More or less quadrangular scraper of greyish-blue flint, chipped along all four sides, and with trimmed base.
- (3) $56 \times 36 \times 25$. Same description as preceding.
- 3rd row. (1) $75 \times 67 \times 24$. Flake, possibly utilized as a *coup-de-poing*, of white flint, with upper surface trimmed, and lower surface consisting of the outside of the original pebble slightly scraped and trimmed.

¹ According to M. Rutot, these so-called Mousterian discs are merely cores, sometimes slightly reshaped in order, perhaps, to serve as missiles. See *Bull. Soc. belge de Géol.*, xxiii (1909), 262.



1



2



3

1. Sporadic implements, possibly pleistocene, from Jersey. (Phot. J. Sincl.)
2. Heart-shaped *Coup-de-poing* from La Cotte de St. Ouen. (Phot. G. E. Lee.)
3. Obverse of same. (Phot. G. E. Lee.)

- (2) $134 \times 93 \times 41$. Heavy amorphous *coup-de-poing* of white flint, with coarse chipping over both surfaces except in the middle of the lower surface, where some of the core is left. Found by Dr. Chappuis at Grève d'Azette, south coast, on the beach.
- (3) $112 \times 45 \times 34$. Triangular implement of white flint, with coarse chipping on two sides and the third cut flat, and showing some of the core. Found Nov. 1882 by Dr. Chappuis on the moorland 350 yards south-east of Grosnez Castle.

Geological Evidence.—(1) In the first place, there must be set down under this head the rather complicated and uncertain facts relating to the subject of raised beaches, taken in connexion with raised sea-caves, as they may be termed. The hard palaeozoic rocks of Jersey preserve many excellent examples of these formations. To distinguish the effects of separate submergences and determine their relative age must always remain an awkward task, especially as no marine shells or other remains have hitherto been detected amongst the banked-up pebbles. Nevertheless, there is perhaps enough evidence to justify a provisional classification of these old beach lines, with the associated caves, as follows. At least four or five distinct groups must be recognized.¹ (a) The high-level raised beach at South Hill of 140 feet (plate LXV. 5) stands by itself, and for the very reason that it is unique is probably the oldest of these formations, time having obliterated all other traces of this deep submergence.² (b) The mid-level group of raised beaches of 60-70 feet is well marked all round the island; and it is with this submergence that I have conjecturally connected the scooping-out of the two Cottés. (c), (d), and possibly (e) The low-level raised beaches of 25-40 feet belong to two or three different groups, one of which would seem to be earlier than the mid-level group and the other or others later. Thus, at Le Cané de la Rivière (plate LXV. 6), one of those shallow caves, with floors 30 feet above o.d., which testify to a former low-level submergence, has its roof and back wall studded with the boulders of a fine raised beach, the top of which is another 30 feet higher. Again, some of the low-level raised beaches, as, for instance, the well-developed one at Portelet, are overlain by a thick layer of loess, a formation

¹ It is interesting to compare the list of raised beaches of Guernsey given by Mr. A. Collenette, 'The raised beaches, and cliff and rubble heads of Guernsey,' *Trans. Guerns. Soc. Nat. Sci.*, 1892, 219 f. These arrange themselves in a low-level series averaging 25 feet above o.d., and another averaging 57 feet (the highest 75 feet). The latter corresponds to the mid-level group of Jersey. Guernsey shows no parallel to the high-level raised beach at South Hill, Jersey, though rolled pebbles occur sporadically at levels as high or even higher.

² Mr. Clement Reid tells me that there is, or was, a raised beach of almost exactly the same height near Chichester; but English parallels are very scarce, a fact pointing to the conclusion that the submergence indicated is ancient, not improbably pliocene.

to be discussed presently. On the other hand, at Green Island, the low-level raised beach overlies the loess, and, as will be shown later by a reference to the Tunnel Street section,¹ can be assigned with some confidence to a submergence of the late neolithic period. I can at present suggest no criterion by which we can clearly distinguish the effects, if any, in the way of raised beaches, of the low-level submergence possibly indicated by the marine gravel underlying the lower peat in this Tunnel Street section. I append a full list of the raised beaches and raised sea-caves of Jersey as at present known to me. The heights given are relative to Ordnance Datum, and must be regarded as approximate only.

North Coast (W. to E.).—Cotte de St. Ouen, r. s.-c., floor 60 ft., lowest layer consisting of sand with water-worn pebbles and boulders, *i. e.* a r. b.; Grève-au-Lançon, r. b., 40 ft.; Creux Gabourel, shallow r. s.-c., floor 30 ft.; Le Cané de la Rivière, a cave of 200 ft. penetration entered by the sea, has above it a shallow cave of about 20 ft. penetration, floor 30 ft., with a r. b. wedged into its back wall and roof, with a greatest height of 60 ft. (Dunlop in *36^e Bull. Soc. jers.* describes this spot under the name of Creux Gabourel, which is close by, but gives heights which, on testing, I found to be too low); Petit Becquet, E. side, r. b., 30 ft.; Grand Becquet, fair-sized r. s.-c., floor 25 ft., covered by a thick r. b.; Douet de la Mer, r. s.-c., floor 30 ft.; Crabbé, r. b., 30 ft.; La Lipende, r. s.-c., 30 ft.

East Coast (N. to S.).—St. Catherine's, low-level r. b., vaguely described by W. C. Trevelyan, *Proc. Geol. Soc.*, ii. (1837), 577; Anne Port, r. b., 60-70 ft. (Dunlop, *Q. J. Geol. Soc.*, 1893, 526); Verclut, r. b., 70 ft. (Dunlop, *ib.*).

South Coast (E. to W.).—St. Clement's, W. of church on main road, r. b., 60-70 ft. (Dunlop gives section in *36^e Bull. Soc. jers.*, 113); Mont Ubé, lane joining same main road opp. Samarès Lane, also parallel lane to the E., r. b., 40 ft., said by Mr. Sinel to have been formerly much more visible than now; Green Island (La Motte), r. b., 40 ft.; Fort Regent, E. side near bridge in Regent Road, r. b., 70 ft.; South Hill, r. b., 140 ft., in cup-like depression, about 11 ft. deep, closely packed towards bottom with well-rounded pebbles, specimens in museum of Soc. Jer. (first described by R. A. Peacock, *Sinkings of Land*, 1868, p. 3; full-page view in Dunlop, *Q. J. Geol. Soc.*, 1893, 524); foot of South Hill, low-level r. s.-c., now blasted away (T. W. Danby, *Geol. Mag.*, 1876, 144); cutting below South Hill, low-level r. b. containing a number of flint pebbles (Dunlop, *ib.*); Hermitage, low-level r. b., now obliterated by harbour works (Danby, *ib.*); Beleroute, r. b., 25 ft.; Portelet, r. b., 25-30 ft.; Fiquet, r. b., 25 ft.; La Moye, in cave, r. b., 25 ft.

West Coast (S. to N.).—La Pulente, r. b., 25 ft.; Le Pinnacle, r. b., 25 ft., with another patch of r. b. near the roof of the tunnel at about 60 ft.; Rouge Nez, in cave, r. b., 70 ft.

¹ See p. 473.

² I have in the first instance drawn largely for my information on the writings of Dr. Dunlop (see A. Dunlop, 'On raised beaches and rolled stones at high levels in Jersey,' *Quart. Journ. Geol. Soc.*, 1893, 523; *Geol. Mag.*, 1893, 376; and *36^e Bull. Soc. jers.*, 112), or else on the coast-lore of Mr. G. Piquet and Mr. E. Guillon; though in almost every case I can speak from personal observation of the facts.

(2) In the second place the loess, as it may be comprehensively termed, which crowns the heights of the island as a thick clayey deposit, and attains in places to a depth of 50 feet, may be considered under the same head.¹ The like formation occurs on the high plateau ground of the neighbouring island of Guernsey,² and indeed is in all respects similar to the loess of the North of France. Here and there it contains large erratics that are frequently tilted at an angle, and rolled pebbles that are often more or less bedded. These consist in all known cases, I believe, of such stone as is to be found somewhere about the island, though often they can be shown to have travelled several miles. This deposit cannot be explained as wholly due to rock-disintegration *in situ*, resting as it often does on a rocky basis which shows no signs of weathering. We shall probably not go far wrong in ascribing its origin in large part to diluvial conditions operating at intervals through the so-called Ice Age.³

(3) A similar formation is found likewise at all lower levels, and may for convenience be considered separately, without implying in the least that its origin or mode of deposition was distinct. It is especially worth noting that various excavations made in the less elevated parts of Jersey show, below the lower peat which undoubtedly corresponds to the early neolithic period, a bed of loess or clay. This is usually more or less yellow, intermixed with fragments of stone that can be shown to have travelled from a distance. Gravel beds occur in places both below it and immediately above it. Not too much stress, however, can be laid on such facts, as these lower layers are eloquently suggestive of unconformity, that is, of gaps in the evidence, testifying as they seem to do to the operation of violent agencies, which must have largely eroded away the pleistocene deposits.

Archaeological in association with Geological Evidence.—The third and last division comprises those rare cases in which geological data admit of some sort of correlation with archaeological and palaeontological discoveries. In the lower levels of the loess two osteological finds have been made which possibly take us back to the pleistocene.

(1) The first, already referred to, is that of a portion of the right humerus

¹ See Dunlop, 'On the Jersey Brick Clay,' *Quart. Journ. Geol. Soc.*, 1889, 118.

² Collenette, 'The raised beaches, and cliff and rubble heads of Guernsey,' *Trans. Guerns. Soc. Nat. Sci.*, 1892, 219 f.

³ Cf. A. de Lapparent, *Traité de Géologie*, 5th edit. (1906), iii. 1698. Diluvial agencies are also invoked by M. Barrois in his masterly paper, 'L'extension du limon quaternaire en Bretagne,' *Annales de la Soc. Géol. du Nord*, xxvi (1897), 33 f., who, however, argues from an examination of the *Lösspuppen*, the calcite of which, acting as a petrifying agent, preserves the lithological character of the primitive loess, that no notable transport has taken place, the loess common to Brittany and the Channel Islands being at least near its place of origin.

of a horse, which was brought to light in the railway-cutting near Pontac, say within twenty feet of the present high-water mark.

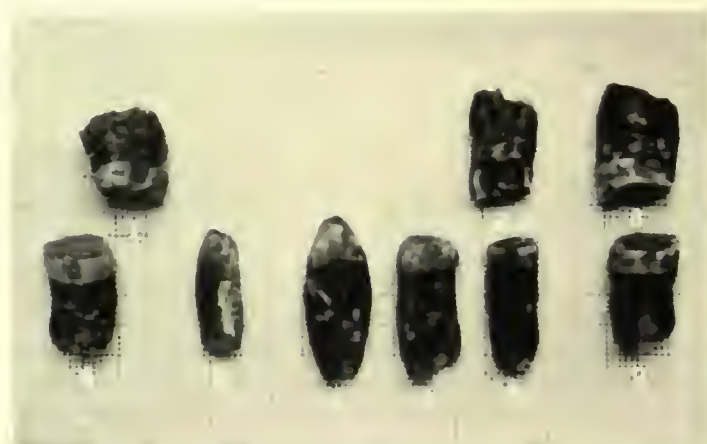
(2) The second is far more interesting, consisting of a somewhat dilapidated human skull, found in 1861 by Messrs. Bott and Bellis, in a site showing no signs of disturbance whether recent or ancient, near the bottom of the loess bed at Green Island (La Motte), about 12 feet below the present surface-level. The loess here rests immediately on the diorite rock, and contains, besides characteristic calcareous concretions (the *Lösspuppen* of the German geologists), fragments of granite which have travelled at least a mile. It is topped by a clayey stratum, wherein flint chippings and, I understand, fragments of pottery occur, and where I have myself discovered an implement of ground grit-stone, own brother to another previously found in the same place. This upper deposit, then, is post-pleistocene without doubt. Above it, again, is a well-marked raised beach, corresponding in all respects with the 40-foot raised beach on Mont Ubé, a mile away inland. Recent soil and vegetation crown this scrap of old Jersey, which, alas! can be shown to be shrinking in circumference at the rate of over a foot in forty years, since Snider bullets fired into it some forty years ago, and having an average penetration of about 15 inches, are now encountered near the surface. The skull (plate LXX. 1, 2), which is now in the museum of the Société Jersiaise, is a mere *calotte*. Moreover, it is damaged at the sides, there being a V-shaped fissure in the right wall that continues in a crack across the crown, whilst the lower part of the left wall has disappeared altogether. Exact measurement, then, is out of the question. The glabello-occipital length alone can be ascertained with some certainty. This I make to be 173 mm. If, however, we assume the two sides of the skull to have been symmetrical, and double the breadth measurement afforded by the sufficiently perfect right side, we obtain an approximate notion of the maximum breadth, which, on this principle, works out at 128 or a shade over. Thus we arrive at a cranial index of at least 74. The basion being absent, no basal height can be estimated, though it is pretty obvious that the skull is not to be classed as especially tapeinocephalic. There is considerable occipital development. The cranium is decidedly scaphoid; and that this is a normal feature, and not the accompaniment of premature synostosis, is deducible from the fact that the sagittal suture is not obliterated, but on the contrary well marked, just as the coronal and lambdoid sutures are also well in evidence. The side-walls are decidedly flat. The supra-orbital ridges, to judge from the right-hand ridge which alone remains, are fairly prominent, though not in such a degree as at all to resemble the brow-ridges of *Homo primigenius*, or indeed those of many a modern aboriginal skull from Australia. Finally, the skull is rather thick, with a rugged surface, suggesting that we are dealing with the remains of an adult male. I venture to conclude, provisionally,



1



2

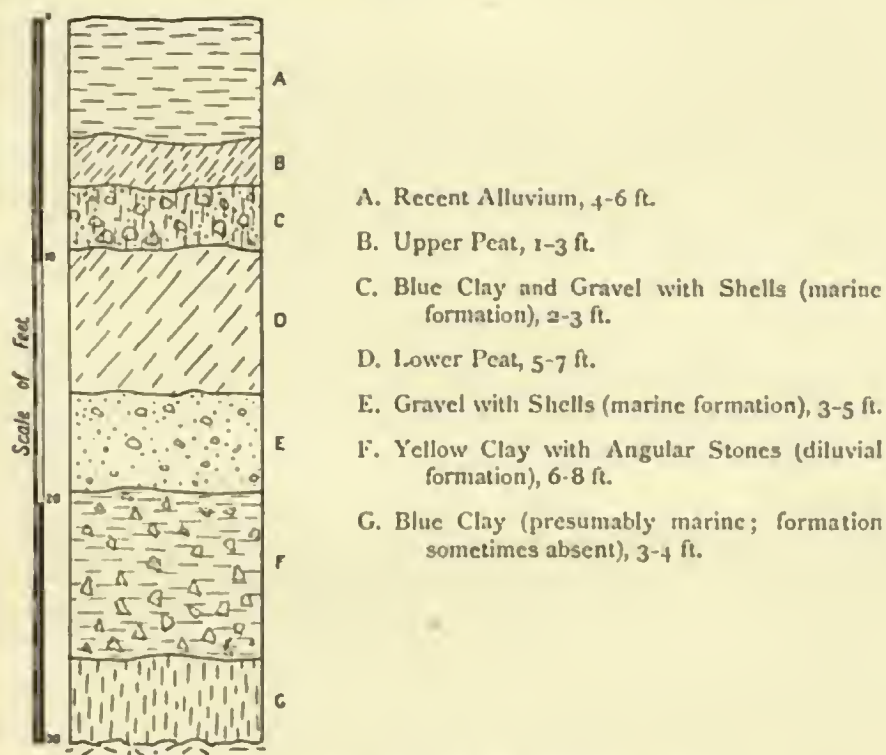


3

1. Skull from the loess-bed at Green Island: lateral view. (Phot. J. Sinel.)
2. Vertical view of same. (Phot. J. Sinel.)
3. Teeth of *Homo Breladensis*. (Phot. F. H. S. Knowles.)

that the skull is ancient, and so ancient as to be contemporaneous with the deposition of the low-level loess in which it was found. This was, presumably, washed down by floods from the neighbouring high lands so long ago that the sea has since had time to eat away a mile of intervening land. On the other hand, I would maintain that the skull is not to be associated with *Homo Breladensis*, the possessor of massively rooted teeth, which imply a correspondingly massive jaw with the rest of the cranium to match, including brow-ridges able to counteract the strain of such a bite; but, if pleistocene, is rather of the superior type that is manifested in the Cro-Magnon skulls, with high foreheads and reduced brow-ridges.

(3) Another piece of evidence, permitting some sort of correlation to be established between traces of man and the geological position in which these were found, comes from Tunnel Street, situated in a low-lying part of the town of St. Helier, about 32 feet above o. d. Here an excavation, made for a gas-holder in 1896, revealed the following section.¹



Synthetic Section, Tunnel Street, St. Helier, Jersey.

Proceeding from below upwards, we find the rock-bed covered with a layer

¹ For description see Dunlop, 'On some Jersey peat-beds,' 21st Bull. Soc. jers., 1906, 350-4, who, however, studies the stratification on the basis of a 15-foot section; whereas, by the kindness of Mr. H. Morris, of the Jersey Gas Light Company, who has furnished me with admirably charted records of ten experimental borings, I am able to carry the section down to bed-rock at 30 feet.

of loess or yellow clay with angular stones, suggestive of diluvial conditions; or else in immediate contact with a blue clay, presumably of marine origin, though without shells, this blue clay having normally six to eight feet of the yellow clay upon it. On this rested a bed of sea-gravel, containing sea-shells (*Purpura lapillus*, L.) and water-worn pebbles. Above it came five to seven feet of peat containing tree-trunks. Here Dr. Dunlop himself discovered a polished diorite axe-head; whilst there were also found two teeth of an ox, possibly *Bos longifrons*, a species that often occurs in the lower of the Jersey peat-beds. Clearly, then, we are at the neolithic level. This peat-bed was divided, by two or three feet of blue clay and gravel containing sea-shells (*Purpura lapillus*, L., and *Trochus umbilicatus*, Mont.) and evidently of estuarine formation, from an upper peat-bed, without trees, and of no great thickness; and upon this rested a mass of recent alluvium, the result of the drainage of the neighbouring valley. Now let us concentrate our attention on the gravel occurring between the lower peat and the yellow clay towards the bottom of the section—a stratification which is frequently met with in sinking wells over all the lower part of St. Helier. On or near the upper surface of this gravel there occurred two fragments of pottery, not water worn, namely, the lip of a small vase, and part of its body ornamented with pit-like markings. This would not necessarily bring this gravel deposit within the neolithic horizon, since it is quite likely that, as is apt to happen with peat, the pottery has worked its way down through the pulpy mass. On or in this gravel, too, were found numerous flint flakes, none of them water worn, showing a bulb of percussion, but without secondary work upon them, those that I have seen being quite small and characterless. The only safe hypothesis is provisionally to connect the flint chips with the pottery, and to refer all alike to the neolithic period. Here, then, we fail to establish any definite traces of pleistocene man.

It only remains to add that, as contrasted with this almost absolute unconformity between the Mousterian stage (as represented by the two Cottés) and the beginning of the neolithic period, the series from this point onwards admits of clear determination. But, lest I exceed the limits of my theme, I must not descant on the glorious remains of the lower peat-bed still visible round the coast of Jersey when the conditions are favourable; as notably in September, 1902, when Mr. Sinel obtained a wonderful photograph of the forest-bed underlying the sands of St. Ouen's Bay (pl. LXV. 4). Fortunately, there exists some good literature dealing with the subject.¹ The map on page 450 shows the

¹ See Dr. Dunlop's already cited study, 'On some Jersey peat-beds,' and Mr. Sinel's papers, 'The submerged peat- and forest-beds of the Channel Islands' (reprinted from the *Guerns. Soc. Nat. Sci.*, 1909) and 'The relative ages of the Channel Islands' (*35th Bull. Soc. jers.*, 1909, 429); also R. A. Peacock, *Sinkings of Land* (1868).

position of the submerged forests round the Jersey coast, namely, at Grève de Lecq, throughout St. Ouen's Bay, on the east side of Portelet Bay, and in St. Aubin's Bay under Noirmont, as well as from La Haule past St. Helier as far as Green Island, Le Hocq, and, if we go back forty years for our evidence, even La Rocque.

Conspectus of Stages in the Quaternary History of Jersey.—It is needless to remark that, considering the amount and quality of the foregoing evidence, any reconstruction of the succession of stages in the quaternary history of Jersey must be provisional, not to say premature, in the last degree. It is a process of making bricks without more than an occasional and dubious piece of straw. The attempt is made here simply in order to present a working hypothesis, to be altered freely as new information comes in, or as the available information is more minutely examined. I may remark also that it would be quite out of the question here to try to correlate the Jersey evidence with the vast mass of facts relating to the quaternary history of the Channel and the adjacent coasts.¹ Indeed, the elevations and submergences to which Jersey has been subjected have a significance of their own, even when so slight as to form almost negligible details in the general geological history of the Channel region. For it must be remembered that with 60 feet of elevation, or with 60 feet of eroded borderland restored to it, Jersey becomes continental, a change which, though geologically trifling, makes all the difference from the human standpoint.²

¹ By way of obtaining a theoretic background, however hypothetical, a passing reference may be made to M. Rutot's ingenious theories, since these deal in special detail with the North of France, at any rate from Belgium as far as the valley of the Seine. He accepts, as indeed do most authorities, Penck's four glaciations, one pliocene, the rest pleistocene. See A. Penck, *Archiv für Anthrop.*, N. F., i (1903). After each glaciation he supposes diluvial conditions to result from the melting of the ice, producing loess-depositing floods in the North of France, owing to a block in the drainage. Such a block, indeed, might easily occur if the present bed of the Channel were tilted up slightly at the westward end, and would make itself felt especially in the narrow part of the ancient bed of the Somme-Seine just north of the Casquets, namely, the chasm known as Hurd's Deep; though whether floods so caused would directly affect the Channel Islands is another question. Further, M. Rutot believes the men of Le Moustier to have come up from the south after the third deluge (severe), and to have inhabited the North of France during the interval (dry, with increasing cold) that led up to the fourth glaciation (relatively slight). This last glaciation, the subsequent deluge (also relatively slight), and an ensuing period of dry cold correspond, in his opinion, to late palaeolithic times, namely, Aurignacian to Magdalenian. See M. Rutot's later writings, especially 'Les grandes provinces quaternaires de la France,' *Bull. Soc. préhist. de France*, 1908, and 'Glaciations et Humanité,' *Bull. Soc. belge de Géol.*, 1910.

² Contrast the fact that about 120 feet of elevation are at present needed to bridge the Channel south-east of Dungeness, 180 south-east of Beachy Head, 240 south-east of the Start, and 300 south-east of the Land's End.

Pre-Mousterian.—(1) Submergence indicated by the 140-foot raised beach on South Hill.

(2) Submergence indicated by the 30-foot raised beach under the loess at Portelet and elsewhere, and by such a raised sea-cave as that at Le Cané de la Rivière.

(3) Submergence indicated by the scooping out of the two Cottés; with which event the 70-foot raised beach at St. Clement's and elsewhere may be provisionally connected.

The one absolutely solid fact on which it is possible to build is that the two Cottés must have been hollowed out before they were inhabited. It is hardly less certain that they are sea-caves, especially in view of the fact that a raised beach forms the bottom layer at the Cotte de St. Ouen. The reasons, such as they are, have already been given for putting the high-level submergence earliest, and a low-level submergence between this and the mid-level submergence. There is likewise evidence from another quarter that submergence to a greater or smaller extent preceded the final deposition of the loess.¹ Thus an excavation in Bath Street, in 1910, as I learn from Mr. Sinel, showed, below the lower peat, a drift of loess or yellow clay with angular stones, which in turn rested on a bed of gravel and shingle, presumably of marine origin, though without shells. Again, not only in Tunnel Street, but also in other parts of St. Helier, according to Dr. Dunlop,² the yellow clay lies on blue clay, sometimes with an intervening bed of large angular rubble, and this blue clay is just the sort of deposit that would be laid down by the sea. It is important to note that there are no traces of sand or shingle above the Mousterian floor of either Cotte, as would surely exist if either a high-level or a mid-level submergence had occurred after the Mousterian occupation. On the other hand, there is nothing to indicate whether the various remains of pre-Mousterian submergence are pleistocene or of still earlier date.³

Mousterian.—(1) Occupation of La Cotte de St. Ouen.

(2) Occupation of La Cotte de St. Brelade, with at least sufficient elevation to permit of land-connexion with the Continent.

The reason for assigning priority to La Cotte de St. Ouen is, as has already

¹ I say final deposition because the loess was probably forming in Jersey, as elsewhere, before Mousterian days. Thus there is good reason to regard the *älterer Löss* of the German geologists as of pre-Mousterian age, whilst their *jüngerer Löss*, on the other hand, may probably be regarded as partly Mousterian and partly post-Mousterian, that is to say, Aurignacian.

² See 36^e *Bull. Soc. jér.*, 115.

³ For Belgium M. Rutot assumes no considerable lowering of the land-level between the Diestian period at the beginning of the pliocene, and the Flandrian at the close of the pleistocene, i. e. post-glacial. See *Bull. Soc. belge de Géol.*, xxxiii (1909), 249.

been shown, simply the morphology of its implements; these seem to be Lower Mousterian, whilst those of the other cave are, perhaps, Middle or even Upper Mousterian. The connexion with the Continent is actually proved only by the remains of fauna found in the Cotte de St. Brelade, but might naturally be expected to cover both occupations alike. It is far simpler to postulate an elevation greater than the present by at least 60 feet; though it is possible, contrariwise, to imagine the level of the sea to have stood as high as now, or even higher. On the latter supposition, the land-connexion must have since been eroded away. This eroded land might have included cretaceous beds producing the material for the Mousterian flint implements, though these have rather the appearance of being fashioned from water-worn pebbles. Also, it might have included sandstone formations similar to those still found in patches on Alderney and the adjacent rocks, since sandstone pebbles are plentifully distributed along the Jersey beaches, whilst neolithic implements of sandstone are likewise not uncommon in the island.

Post-Mousterian.—(1) Final deposition of loess, with diluvial rainwash from higher land forming the earthy matter in which occur the Pontac bone of a horse and the Green Island skull.

It should be mentioned that the loess drift is likewise found below the present sea-floor.¹ This fact would seem to prove that the loess was at least in part deposited during a time of elevation. On the other hand, it must remain an open question whether these submarine beds represent an earlier or a later stage of the loess formation.

(2) Simultaneous or successive would be the formation of the 'head' filling up the Cotte de St. Brelade.²

(3) Simultaneous or successive would likewise be a return to the present level or possibly a slight submergence, as indicated by the gravel, with marine shells, intervening between the loess drift and the lower peat in the Tunnel Street section.

If the fragments of pottery and flint-chippings found on or in this marine silt be regarded as contemporaneous with it, the submergence would have to be referred to an early neolithic horizon. It has been already argued, however, that these remains of human handiwork may well have found their way down through the peat. The gravel appears to be merely estuarine, to judge from the fact that the shells are of a littoral type. It is to be noted that, if Jersey became insular at the close of the Mousterian period, and remained so until

¹ See Dunlop, section at North Pier given in 21^e *Bull. Soc. jer.*, 356.

² M. Rutot remarks that there seems to have been a general filling-in and collapse of cave-shelters at the close of the Magdalenian period, and names it *l'époque du grand détritique*. See *Bull. Soc. belge de Géol.*, xxiv (1910), 70.

neolithic times, this reason would amply account for the absence of any clear trace of the later palaeolithic industries. Arguments from absence are, however, worth little.

(4) Considerable elevation of the land coinciding with the 'period of submerged forests'.

The lower peat contains the remains of fine trees, which could not have grown in the situations in which they now occur, for example, far out in St. Ouen's Bay, unless the land had stood at least 60 feet higher than it does at present. This amount of elevation would provide the land-connexion between Jersey and France which we know to have been utilized by immigrants of the early neolithic age.

(5) Submergence indicated by the raised beach existing above the peaty layer with neolithic remains at Green Island.

To judge by the fact that this raised beach corresponds with a 40-foot raised beach on Mont Ubé a mile away, from which Green Island was probably cut off at this time, the submergence would seem to have been at least to the extent of 20 feet below the present mean level. The marine silt with littoral shells that occurs between the two beds of peat in the Tunnel Street section must be treated as due to the same cause operating on a lower plane. Mr. Clement Reid assigns this last subsidence to late neolithic times, and gets a date for it of about 1500 B.C. or a few centuries earlier.¹

(6) Restoration to present level, and growth of the upper peat, a mere moss-peat of no great thickness.

Appended is a diagram showing those changes in the mean sea-level at Jersey which seem to be required by the foregoing considerations. Of course, no attempt is made to represent the duration of the successive periods. Submergence and emergence are used in a purely relative sense, and do not necessarily connote earth-movement. In marking the height at which Jersey becomes continental, no allowance is made for the former existence of intervening land now eroded away.

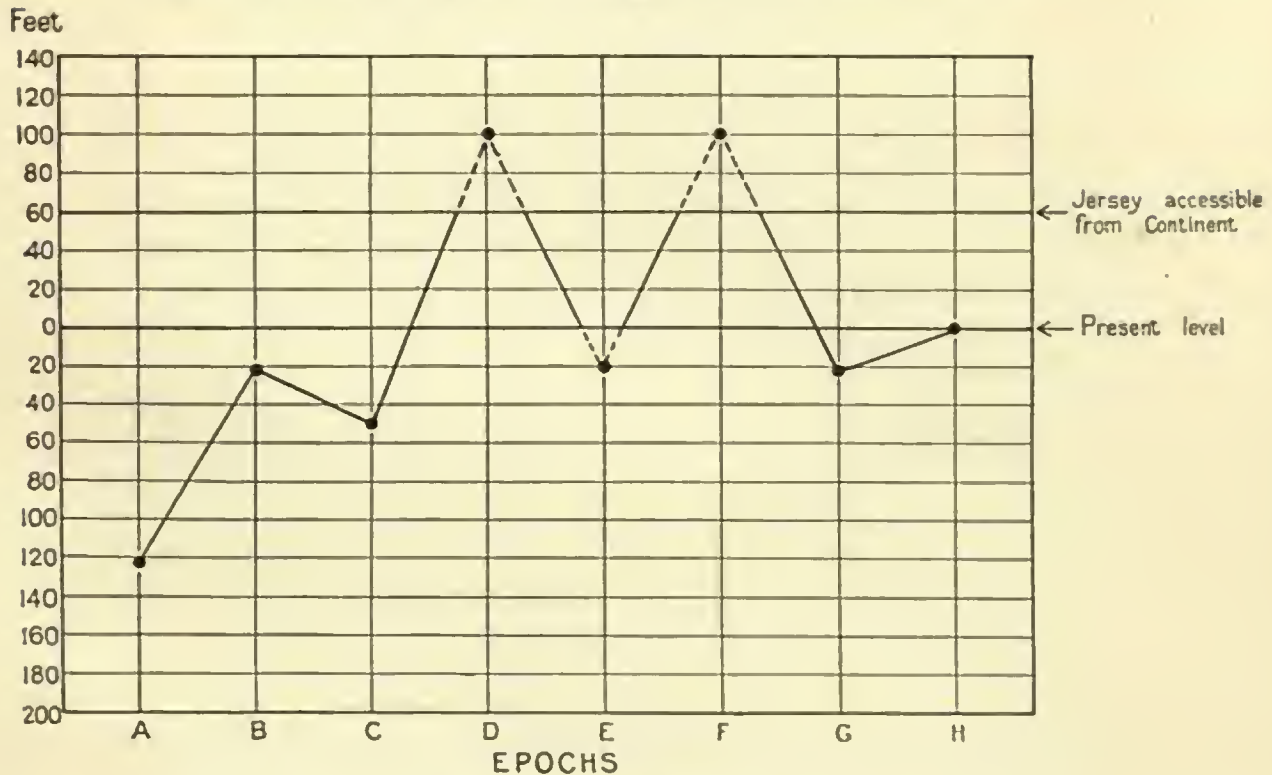
In conclusion, I would venture to insist that, in regard to pleistocene history, there is plenty of important work to be done in, and in the neighbourhood of, the Channel Islands by the archaeologist and the geologist acting in concert. As I have tried to show, Jersey in itself offers problems in abundance. The excavation of the Cotte de St. Brelade must be finished. The search for more palaeolithic sites, as well as for raised beaches and raised sea-caves, must be carried on. The geology of the plateau loess and of any layers that intervene

¹ See C. Reid, 'The Island of Ictis,' *Archaeologia*, lix (1905), p. 281.

CHANGES IN THE ELEVATION OF JERSEY

AS SHOWN BY THE CHANGES IN MEAN SEA-LEVEL

[N.B.—The difference between mean and high tide-levels, roughly 20 feet, must be added to get height of raised beaches; *e.g.* 120 feet submergence = 140 feet raised beach.]



PRE-MOUSTERIAN.

A. Submergence indicated by high-level r. b., South Hill (seemingly oldest because unique); probably pliocene. B. Submergence indicated by r. s.c., Le Cané de la Rivière; probably also by other low-level r. s.c.'s and r. b.'s, *e.g.* the r. b. below loess (with loess likewise underneath) at Portelet. C. Submergence indicated by mid-level r. b.'s (since one overlies upper cave at Le Cané de la Rivière), and by the two Cottés; possibly not very long before Mousterian occupation (to judge by cave-earth at La Cotte de St. Ouen).

MOUSTERIAN.

D. Emergence indicated by occupation of the two Cottés (since Continental fauna); middle pleistocene period.

POST-MOUSTERIAN.

E. Return to present level, or possible submergence, indicated by marine gravel, up to about 18 feet above o.n., below lower peat in Tunnel Street section; probably late pleistocene period. F. Emergence indicated by lower peat (the submerged forests needing at least 60 feet elevation to have grown in place); coinciding with early neolithic period. G. Submergence indicated by low-level r. b. at Green Island, and marine silt between upper and lower peats in Tunnel Street section; coinciding with late neolithic period. H. Return to present level.

between the lower peat and bed-rock must be investigated with greater attention to details than they have hitherto received. The material in the museum of the Société Jersiaise must be subjected to a rehandling of a thoroughly critical and exhaustive nature. And, finally, new evidence of all kinds, such as may warrant more decisive interpretations, must be called into existence out of the unknown.

XXI.—*Notes on an Anglo-Saxon Cemetery at Market Overton, Rutland.* By
V. B. CROWTHER-BEYNON, Esq., M.A., F.S.A., Local Secretary. With a
supplementary note by E. THURLOW LEEDS, Esq., B.A., F.S.A.

Read 30th March, 1911.

MARKET OVERTON is situated about a mile from the northern border of Rutland and a little under two miles south-west from the point where the three counties of Leicester, Lincoln, and Rutland meet. Here, in August 1906, iron-stone workings were begun on a fairly large scale, and these operations have continued to the present time and are likely to go on for a considerable period. In the course of the excavations a large number of antiquities have been found, ranging, in point of date, from the neolithic period down to mediaeval and later times. Some of the objects found were exhibited before the Society on Jan. 30th, 1908, when I had the honour of presenting a report as Local Secretary for Rutland.¹ The present paper deals with finds which have occurred since my 1908 report, and will be confined to a consideration of objects of the Anglo-Saxon period, which far exceed, both in number and interest, those of other periods which have come to light at Market Overton. It is quite clear that two distinct cemeteries existed here, separated by an interval of some 400 yards. The Saxon finds described in 1908 occurred in what may be distinguished as the North Cemetery, measuring approximately half an acre in area. The present series of relics were all met with in the South Cemetery, the size of which was apparently about double that of the other. In both cemeteries the quantity of human remains recovered was quite insignificant, the soil being evidently unsuitable for preserving the skeletons. It is a matter for the greatest regret that it has been found impossible to excavate the site scientifically, and that consequently little or no information is available as to the association of the relics one with another or the relative positions in which they were found. Nor is it possible to state anything as to the direction of the graves or the sex or age of the bodies. Among the twenty-five earthen vessels of various types which have been preserved, six contained fragments of teeth or bones, a fact which seems to suggest that cremation was in use to a limited

¹ *Proceedings*, xxii. 46.

extent as a method of dealing with the dead, but with such incomplete data it seems vain to attempt to draw definite conclusions as to the nature of the graves. The methods employed by the Ironstone Company are fatal to any attempt to collect the finds into grave-groups, and we are compelled, therefore, to treat them as a series of individual objects. The digging operations have extended some way beyond the area in which the graves were situated, and it seems probable that the limits of the cemetery have been reached and that the site is exhausted from the archaeological point of view.

Iron spear-heads occurred in the South Cemetery in considerable numbers, some thirty examples of various shapes and sizes having been preserved, of



(a) Silver brooch.

(b) Silver collar or torc.

(c) Square-headed brooch.

Fig. 1. Jewellery from Market Overton, Rutland. Nearly $\frac{1}{2}$.

which the largest measures 21 in. in length. To these may be added eight shield bosses. All the spears and bosses, however, are of well-known types and present no unusual features. Two fairly well-preserved horse-bits and three keys of characteristic shape have also occurred. A more unusual find, however, consisted of a number of iron fragments which appear to have been the mountings of a large bucket, possibly lined with bronze, as a small piece of that metal remained on one of the pieces. The finials of the loops to which the movable handle was attached take the form of drooping animal heads with open jaws, which may be compared to those so commonly seen on large square-headed brooches. The iron mountings of a large bucket from Sleaford, Lincs., preserved

in the British Museum,¹ bear considerable resemblance to those from Market Overton, though the scroll-work on the latter is rather more elaborate. The large bucket found in the Saxon tumulus at Taplow, Bucks., is described as being 'lined with plain bronze'.²

The pottery which has come to light at Market Overton has no great artistic merit. Of the twenty-five vessels found in the South Cemetery, eleven are small, undecorated, round-bottomed pots of domestic character, and only two of the remainder exhibit the characteristic Teutonic shoulder, while none at all have projecting bosses round the body. They vary in size and form, the largest being 10½ in. high and 26 in. in circumference, and the smallest 3¼ in. in height with a girth of 11 in. One pot has a somewhat unusual form of decoration, consisting of a series of longitudinal lines in relief, with a turn to the right at

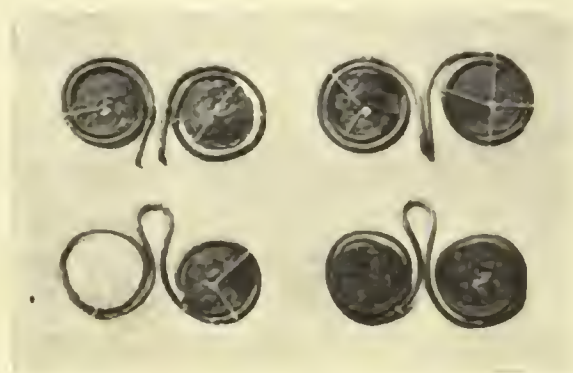


Fig. 2. Clasps of silver wire. Market Overton, Rutland. ½.

the top—forming a device resembling a hockey-stick—repeated six times on the body of the vessel.

Beads have occurred in fairly large quantities, though they may not, perhaps, present any uncommon features. The prevailing material is amber, but a large number are of vitreous paste, some are of glass and rock-crystal, and a few are imitation pearls of small size, both single and double.

Perhaps the most interesting group of objects in this collection are the silver ornaments. The graceful torc or collar (fig. 1 *b*) is believed to be the only one of this pattern in the country.³ It measures 14 in. round the curve, and the fastening has been by means of a hook and loop, though the former is imperfect. The two ends of the ornament are round in section, but 4 in. from each end the metal is beaten out flat and increases in width towards the centre.

¹ *Archaeologia*, i, pl. XXV, fig. 1.

² *Journ. Brit. Arch. Assoc.*, xl (1884), 64.

³ One found at Ipswich carries a bead: *Proc. Suffolk Inst. Arch.*, xiii (1909), 6, pl. IV, fig. 5.

The flat portion is ornamented with gilded triangular compartments, thrice repeated, and is further embellished with punch-marked decoration.

Equally pleasing is the series of hook-and-eye clasps of silver wire. The general principle is the same in all, and is in fact precisely that of the present-day hook and eye on a much larger scale. The two loops, corresponding to those by which the ordinary hook and eye are sewn on to the fabric, instead of making one complete circle only, are produced to form a spiral of several convolutions. A very similar pair of clasps was found at Kenninghall, Norfolk, and is now in the British Museum.¹ Another pair is recorded from Sleaford, Lincs. (*Arch.*, 1, pl. XXIV, fig. 6), a third from Beeby, Leicestershire, and a fourth from Twyford, in the same county.²

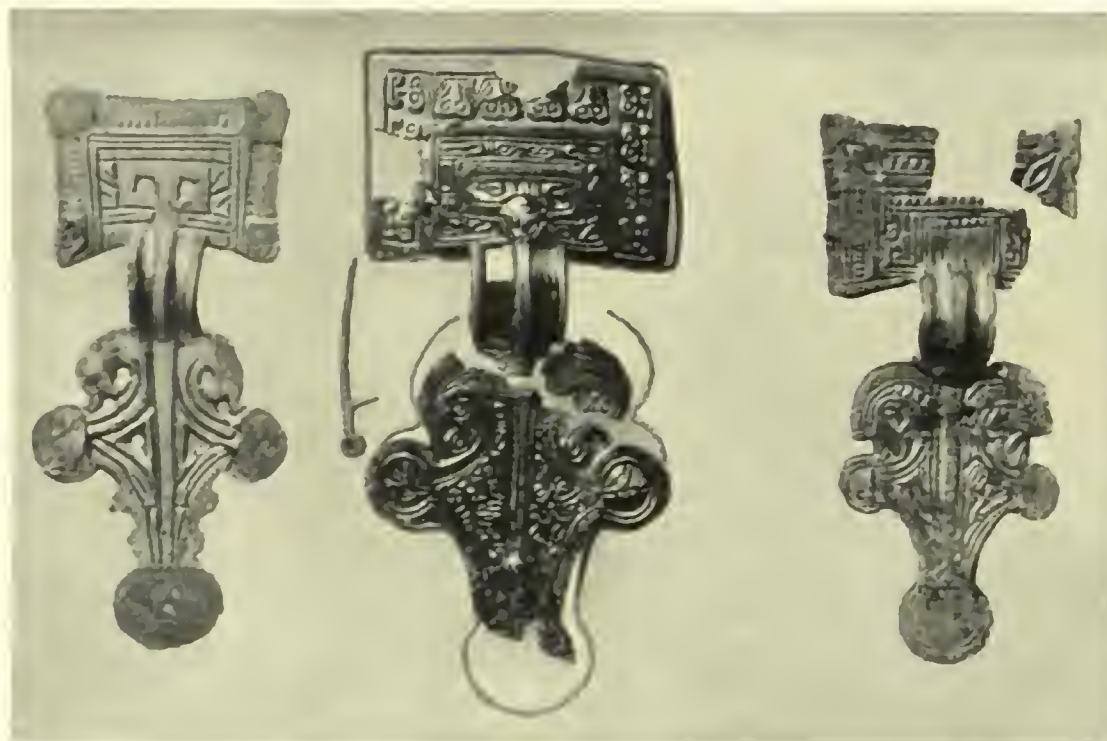
The two pairs of clasps, fig. 2, exhibit a variation of form which appears to be unknown from other sites. At a first glance at these examples, the centre of each spiral has the appearance of a flat disc, but on examination it will be seen that this appearance is caused by the wire having been beaten flat, leaving a small opening in the centre where the wire comes to an end. The 'discs' are $\frac{3}{4}$ in. in diameter and have been gilded and decorated by a series of punch-marks in the form of concentric circles. Hook-and-eye clasps of the type to which the Market Overton specimens belong are well known from Northern Europe, where they occur in some late finds of the Migration period, such as the Porskjæ moor find, and persist down to the Viking period.

Five fragments of fluted silver, measuring in the aggregate 7 in., have doubtless formed part of one or possibly more armlets, such as may be seen in the British Museum from Longbridge, Warwickshire, and Barrington, Cambs. The latter site also provides a parallel for an armlet of flat silver increasing in width at the ends.

Four discs or bracteates of silver have come to light, but none are perfect. The largest measures about 1 in. in diameter, and is decorated with two concentric circles of punched ornament, the centre consisting of a raised boss. A somewhat similar object occurred in the North Cemetery, and is figured in the coloured frontispiece of the *V. C. H. Rutland* (fig. 2), where it is erroneously described as having been found at North Luffenham. A small silver disc with a central boss was also found at Faversham, Kent, and is preserved in the Ashmolean Museum at Oxford. Of the other silver bracteates from Market Overton, two have the central boss, while the third is ornamented with a repoussé pattern of interlacing strap-work. The last named appears to have been cut down to its present size from a larger plate, and, if so, may be compared to the Lombardic crosses as regards the method of manufacture. The only other object of silver is a small penannular brooch with recurved ends.

¹ *V. C. H. Norfolk*, vol. i, pl. facing p. 340, fig. 1.

² *V. C. H. Leics.*, i, p. 236.



1

2

3

Square-headed brooches, Market Overton, Rutland. $\frac{1}{2}$



4

5

6

Cruciform brooches, Market Overton, Rutland. $\frac{1}{2}$

With regard to ornaments of bronze, a very interesting series of brooches of several distinct types has been collected from this site. Of square-headed brooches there are four examples, all ornamented with gilding, and three of them further enriched with silver plates. All have certain features in common, such as the rounded foot, the projecting lateral lobes, and the open-jawed beasts' heads (more or less conventionalized) on either side, below the bow. Pl. LXXI, fig. 1 is probably the earliest in date of the series, and, apart from the usual beasts' heads, has no sign of animal pattern in the ornamentation. Pl. LXXI, fig. 3 has an incised cross of double lines on the foot, and the upper angles of the oblong head show a tendency to develop the projections characteristic of the late examples of this type of brooch. A distinct impression of cloth appears on the metal in the upper part of the head. In fig. 1 c the lateral lobes are much accentuated, and with the foot combine to give a quasi-cruciform appearance to the lower part of this example. The bow has almost ceased to be functional, and is little more than a truncated pyramid, to which has evidently been attached an ornamental disc similar to those found upon brooches of the same type from Tuxford, Notts.,¹ and Barrington, Cambs.² Silver plates are (or have been) attached to the circular projections, and also to the angles of the head of the brooch.

The group of brooches just described show a very remarkable similarity to some found at Ipswich in 1906.³ Indeed, the resemblance between fig. 1 c from Market Overton and fig. 9 (4) from Ipswich amounts almost to identity, and can hardly be accounted accidental. Scarcely less striking is the similarity of pl. LXXI, fig. 1 (Market Overton) and fig. 7 (3) (Ipswich), the only point of difference being that the perforations in the lower part of the brooch are, in the Rutland example, round holes, whereas in the other they are shaped to follow the design of the ornament. These brooches belong to a class which seems to be fairly well represented in Suffolk, Norfolk, Leicestershire, Northants, and Yorkshire, and which has also occurred in the south and west, while its original ancestry has been traced to Germany and South Scandinavia.⁴ The fourth specimen (pl. LXXI, fig. 2) in the square-headed group from Market Overton is sufficiently remarkable to merit a detailed description. It is unfortunately somewhat damaged, but not sufficiently to allow of any doubt as to its original form. The oblong head has no protruding angles, and is covered with zoomorphic ornamentation, while the central rib of the bow is embellished with an applied silver band. There is a well-defined midrib running from this to the foot, the extremity of which is missing, but a part of what seems to be an attenuated version of the 'horse-head', characteristic of the so-called 'long brooch', may be seen just above the break. The side lobes bear representations of human faces looking to-

¹ *Proceedings*, xxi, 35.

² *Archaeologia*, lx, pp. 333-4.

³ Library of Trin. Coll., Camb.

⁴ Cf. *Proceedings*, xxi, p. 233.

wards the centre, and in this particular, as well as in general style, the brooch may be compared to one from Fairford, Glos., figured by Akerman.¹ A peculiar feature of the present example consists of a frame or border of silver wire² which follows the outline of the brooch, and which has originally been brazed to the edge, but is now detached. Where this wire passes over the bow it has been riveted through the metal. Another unusual, if not unique, attribute of this brooch is the pin, which is of bronze, and which, instead of working by means of the usual hinge or coil, is fitted with a spur or heel-catch projecting at a right angle (or nearly so) from the shank of the pin. This heel-catch, pressing on the back of the brooch and acting like the fulcrum of a lever, would enable the pin, by its own elasticity, to be held securely in the hollow of the loop or catch attached to the lower part of the brooch. This type of pin is well known on the later examples of the 'animal-head' and 'box' brooches, whose evolution forms such an interesting feature in the archaeology of the island of Gotland in the Baltic, but it appears to be unrecorded among Anglo-Saxon brooches of the pagan period in this country.

Of the next class of brooch—the 'cruciform'—the present site has produced three good examples, all of an ornate kind. Though differing in detail, as can be seen by a reference to the illustrations, they display a strong general resemblance. The ornamentation is zoomorphic of a debased kind, and the date cannot be placed earlier than the seventh or late sixth centuries. Pl. LXXI, fig. 5 may be compared to a brooch from Saxby, Leicestershire.³ The rectangular lateral projections below the bow are of exaggerated size, which somewhat mars the proportions of the brooch, but the bow is sufficiently elevated to be of use, whereas in pl. LXXI, figs. 4 and 6 the bow consists of little more than a thickening of the metal. Pl. LXXI, fig. 4 finds a parallel in a brooch found at Rothley Temple, Leicestershire.⁴ In all three examples the bow is crowned with a solid stud, either square or round. It is interesting to note the different methods of treating what is fundamentally the same idea, employed in these three cruciform brooches. The figure just below the lateral wings on the lower part of the ornaments is of course derived from a face—either of a man or beast. In the first example (pl. LXXI, fig. 5) the eyebrows are formed of three parallel lines, and the eyes altogether have a reasonably natural appearance, though the nose is treated conventionally. In the next (pl. LXXI, fig. 6) the eyebrows are solid, the outer ends being brought round so as almost to meet the sides of the nose, where they terminate in round

¹ *Remains of Pagan Saxondom*, pl. VII.

² Cf. *Arch. Cantiana*, vi, 181, from grave CLIX at Sarre, Kent, pl. VI, fig. 1: 'an edging of thick chased silver-wire has apparently once run round its outer edge, as in the case of other fibulae of this pattern: only part of this remains.'

³ *V. C. H. Leics.*, i. 235.

⁴ Akerman, *op. cit.*, pl. XX, 2.

pellets. In pl. LXXI, fig. 4 the figure appears almost as a quatrefoil, with a pellet in each compartment. The cruciform type of brooch is the direct descendant of the earlier 'long brooch', the fan-shaped foot of the former being an exaggerated development of the nostrils of the earlier 'horse-head', while the knobs at the top and sides of the head of the 'long brooch' have become flat surfaces providing accommodation for the profuse ornamentation which came into vogue in the sixth century.

The round brooch is represented among the finds in the South Cemetery by three examples, two being of the 'applied' class, and the third of the kind known as the 'saucer'. Of the two former, one is imperfect and the other a mere fragment, but the 'saucer' brooch is in fair condition, and displays a design similar to that on the brooch found at Shefford, Beds.¹ The loop attachment and catch for the pin are well preserved at the back of the brooch. The North Cemetery at Market Overton produced two good examples of the 'applied' circular brooch, a form which is believed to have originated in this country.²

The open-work round brooch with swastika centre has also occurred in both cemeteries at Market Overton, and two from the South Cemetery are fairly perfect. The class of brooch, however, which is most strongly represented here is the annular, of which some fifteen examples have come to hand. Some of these are fitted with bronze pins, and are in excellent condition, but the majority have had iron pins, and these are for the most part rusted away. The ring part of the brooches varies in different specimens. In some it is flat or flattish in section, with or without punch-marked decoration; in others it is round in section, either plain or transversely ribbed. This type of brooch has occurred in considerable numbers in the East Riding of Yorkshire. Among the miscellaneous bronze articles found was a key-ring, 2½ in. in diameter, worn by friction into a hollow at one part of the circle. Other bronze rings included in the collection may have formed part of horse-trappings. A much-corroded bunch of iron and bronze rusted together has doubtless been a chatelaine chain. It contains a fusiform object of bronze-gilt, having the appearance of a bead or swivel. A somewhat similar object was found near the hip of a skeleton at Gilton, Kent.³ The pin has been formed by rolling or bending a flat strip of bronze and brazing the seam. The flat head of the pin is pierced for the suspension of ornamental plates or spangles, as in the case of the pins found at Leagrave, Beds.,⁴ and Brighthampton, Oxon.⁵ Mention should also be made of a bronze buckle, which has been tinned and is ornamented with punch-marks. On the back is a very distinct impression of the garment to which it was fastened or over which it

¹ *Arch. Journal*, vii. 79.

² *Invent. Sepulchr.*, pl. XII, 5 a, b.

³ *Archaeologia*, xxxviii, pl. III, fig. 1.

⁴ *Proceedings*, xxii, plate facing p. 52.

⁵ *Proceedings*, xxi, p. 60.

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was worn. Being of a type more usually associated with Kent and the South of England, its occurrence in Rutland is interesting. A few minor objects of bronze, such as a diminutive garter-buckle and a small object of spatula-like shape with remains of iron rivets, complete the list of finds in this metal.

There remain to be considered the only gold objects which have come to light in either cemetery, and a round-headed brooch of silver having certain peculiar characteristics. The articles of gold are a bracteate, a bead, and a spiral finger-ring. The first (fig. 3) has a diameter of $1\frac{1}{2}$ in., with a punch-marked border of triskeles and an inner line of embossed dots. Within is a more or less disintegrated figure of a horse, and above is a spirited representation of a bird. The loop of the bracteate is decorated with a line of dots in relief, and in the



Fig. 3. Gold bracteate. Market Overton. $\frac{1}{2}$.



Fig. 4. Gold bead. Market Overton. $\frac{1}{2}$.



Fig. 5. Gold ring. Market Overton. $\frac{1}{2}$.

centre of the ornament is a small hole so carefully punched as to suggest its having been made intentionally. Mr. E. T. Leeds has dealt more fully with this interesting object in a supplementary note to the present paper. The hollow gold bead (fig. 4) is about $\frac{3}{4}$ in. long, the shape being that of two truncated cones joined base to base. There is a transverse rib running round the line of greatest girth and several longitudinal ribs running from this to the opening at each end. The expanding ring (fig. 5) has a diameter of about $\frac{1}{2}$ in. and forms rather more than a complete coil and a half; the total length when extended would be about 3 in. It is slightly decorated with faint punch-marks.

The silver brooch (fig. 1 a), which is also dealt with in Mr. Leeds' notes, measures $3\frac{1}{2}$ in. in greatest length in its present state, but a small portion of the foot is unfortunately lost. The head is semicircular, with a border consisting of bird-heads, the eyes being represented by hollow sockets which have doubtless been filled originally with garnets or other ornamental material. The foot is elliptical in shape, and terminates with a fairly naturalistic animal's head. No other brooch of this type has been found in this country, so far as can be ascertained.

To judge by the objects recovered from the two cemeteries at Market Overton, there seems to be little evidence of any wide interval between the sites in point of date. The ornate square-headed brooch, the annular brooch (both

simple and with the swastika centre), and the 'applied' circular brooch all make their appearance in both. The pottery and beads also agree in type, while in both cemeteries spear-heads and shield-bosses have occurred in substantially similar proportions. When, however, we compare the finds at Market Overton with those at North Luffenham in the same county, where another Anglo-Saxon cemetery existed,¹ there is sufficient divergence of types to enable us to differentiate the two sites in date. At North Luffenham the simple 'long brooch' occurred in considerable numbers, whereas it is entirely absent at Market Overton. Again, the proportion of swords found at the former place is markedly large, while at the latter the sword is almost, if not altogether, wanting. Some of the pottery, again, from North Luffenham is more distinctively Teutonic than that from Market Overton, and includes examples of a far more elaborate character than any found on the latter site. On the other hand, we find several points of similarity, such as the elaborate cruciform brooch, the swastika-centred annular brooch, and the 'applied' round brooch, which are all common to both. It would appear from the evidence that the community at North Luffenham were not using their cemetery later than about A. D. 575, while at Market Overton the cemetery was hardly used earlier than about A. D. 550; so that in all probability there was a short period of overlapping in the use of the two sites. The parallels which have been cited for objects found at Market Overton are drawn from various places lying in many directions, and no doubt the list could be largely extended, but undoubtedly the closest connexion appears to exist with East Anglia, and is so striking as to afford clear evidence of long-standing and frequent intercourse. Nor is this difficult to account for on geographical grounds, for with such practicable waterways available as the Ouse, the Nen, the Welland, and the Glen there would be no serious obstacle to prevent a seafaring people such as these East Anglian settlers from penetrating within easy reach of the Market Overton settlement.

The Market Overton finds are the property of Major Wingfield, D.S.O., of Tickencote Hall, Rutland, on whose land they were found, and we are indebted to him for his kind permission to exhibit them before the Society. What the ultimate home of the collection is to be is a matter which is not yet decided, but that it will be carefully preserved and its value duly appreciated there need be no fear. For the present it remains in the custody of our Fellow Mr. W. H. Wing, who resides at Market Overton, and to whom the Society is deeply indebted for the time and care he has expended in connexion with the site and the discoveries which have been made upon it. Not only has he been indefatigable in his oversight of the workmen employed at the ironstone workings, so far as his various other duties have permitted, but he has also undertaken

¹ *Assoc. Archit. Soc. Rep.*, xxvi. 246 foll., and *ibid.*, xxvii. 220 foll.

the arduous and sometimes tedious duty of cleaning, mending, and arranging the various objects as they came to hand. Where such a large number of workmen are employed, a certain amount of leakage is wellnigh inevitable, but it is safe to say that, but for Mr. Wing's vigilance and the good relations he has established and maintained with the men, the Market Overton collection would never have attained its present extent and value.

I desire, in conclusion, to express my deep indebtedness to our Fellows Mr. Reginald Smith and Mr. E. T. Leeds for much valuable and kind help in the preparation of this paper.

Supplementary Note on the Gold Bracteate and Silver Brooch from Market Overton.
By E. THURLOW LEEDS, Esq., B.A., F.S.A.

THE bracteate from Market Overton (fig. 3) carries with it a special interest, as it belongs to a class of ornaments which occur with great frequency in North Europe, but which are but scantily represented in England. It is true that a large number of pendants of similar form found in Kentish graves are, strictly speaking, bracteates; but it is to the more distinctive class, whose evolution can be traced from coin and medallion types of the late Roman emperors, that reference is here made. In this class must be included such bracteates as those found at Sarre, Kent. They belong to a somewhat late series, with a very widespread diffusion ranging from North Germany to Scandinavia and England. Those types, however, which stand nearer in time to their Roman prototypes are very scarce in England. One remarkable example was found at the end of the seventeenth century in St. Giles' Field, Oxford,¹ and is now in the Ashmolean Museum (fig. 6). It belongs to a class derived from late Roman coins bearing the head of an emperor. It differs, however, in its details in so marked a degree from its continental parallels that our Vice-President, Dr. A. J. Evans, has long claimed that it may fairly be considered to be of Anglo-Saxon fabric. Is this the case too with the Market Overton example? It is primarily connected with a large and widely distributed series, ornamented with a device consisting of a rider on horseback, which is similarly derived from a common reverse found on late Roman coins.



Fig. 6. Bracteate from St. Giles' Field, Oxford. $\frac{1}{2}$.

Salin in a paper entitled 'De Nordiska Brakteaterna'² has subjected the bracteates of Northern Europe to a critical investigation, and has distinguished several subdivisions of the particular type above mentioned, coinciding in some measure with definite geographical areas. In all these the progressive stylization which characterizes all the northern zoomorphic ornament of the period is very marked. The figure of the rider is in course of time reduced to the head alone, of large size, and resting immediately on the back of the horse, while the horse itself loses to a large extent the semblance of its former self. So much so that in some cases it even has horns added. In the Market Overton bracteate the rider is entirely

¹ Plot, *Natural History of Oxfordshire*, p. 359. ² *Antiqvarisk Tidskrift för Sverige*, xiv, part 2, p. 1 ff.

absent. It has nevertheless features so closely resembling those found on some of continental types that it is worth while to compare them in detail.

The subdivisions of the class above mentioned which concern us here are two. They are numbered by Salin V and XII respectively.¹ The first he terms the Danish division, as all the examples known to him in 1899 come from Denmark except four, three of which are from South Sweden, and the fourth from Stavanger, Norway. Of these four only two have the bird portrayed, while of the Danish examples, fifteen in all, only two are without it (fig. 7). The second class he calls derivatives from the Danish division (fig. 8); they come chiefly from Norway and South Sweden, but two have been found in North Germany, namely, in the provinces of Holstein and Hanover. As the Market Overton bracteate resembles more nearly those of the latter division, it is perhaps advisable to examine this division first. One of its most striking features is the disposition of the body at



Fig. 7. Bracteates from Denmark and Skåne, illustrating the 'Danish' division.²



Fig. 8. Bracteate from Skåne, belonging to 'Danish-derivative' class.



Fig. 9. Bracteate from Denmark of intermediate type.

right angles to the neck. The result of this is that when the front legs are disconnected from the body, as is the case in some examples, the borders of the neck and body form a right angle, without doubt partly caused by the position of two bands which may be intended to represent a collar and surcingle. These in the earlier Danish class appear to be placed so close together as to meet on the withers. In some of the other subdivisions of this type they lie too far apart for this to happen. Secondly, the Danish derivatives seem to be marked by the absence of the off-side hind leg. The shape of the head and the disposition of the front legs in the Market Overton bracteate also can be paralleled from continental examples. But perhaps the most noticeable feature is the manner in which the parts of the neck and body inside the contour lines are embossed with low angled surfaces. This feature is found outside this division only among derivatives from a South Swedish class, three examples of which are cited by

¹ *Op. cit.*, pp. 46, 59, 101, and 106.

² Figs. 7, 8, and 9 from *Antiquarisk Tidskrift för Sverige*, xiv. 2, figs. 57, 58, 73, 74.

Salin with Danish provenances. It is, as Salin has suggested, probably due to the process of embossing the bracteates with the aid of a wooden matrix.

It will thus be seen that the decoration of the Market Overton example presents very close analogies to this northern division. It should be noted, however, that on none of the examples given by Salin in his table of representatives of this class does the bird appear, while, as has been shown, it occurs more often than not in the specimens belonging to his division V, the Danish division proper. Salin figures one bracteate, probably from Denmark, which he regards as an intermediate form (fig. 9). It has the characteristic embossing of the neck and body, such as occurs in class XII, but a stylized bird is portrayed in the field. The bird on the Market Overton bracteate is, however, portrayed in a very spirited manner, and is very similar to that on a bracteate from Denmark belonging to the earlier class (fig. 7).

There can be no doubt that the Market Overton bracteate is one of these intermediate forms, and this in spite of the poor execution. The shape of the foot also seems to support this view; it still retains more or less the semblance of a hoof, and has not suffered from the ever-increasing stylization which eventually led to the feet of all animals alike being rendered in a claw-like form.

Its place of manufacture is a more difficult matter to decide. The absence of the rider's head suggests that it was England, as the portrayal of the human head in profile during this period is very scarce in this country. The treatment of the legs is also unlike that seen on any Scandinavian types.

Everything seems to point therefore to its manufacture in England. At the same time it was almost certainly made by some one who had seen a Danish model not long before, perhaps one of the earlier Teutonic immigrants to our shores. He had, however, in that time forgotten how, or perhaps was not offered sufficient monetary inducement, to portray the human face; but he was sufficiently skilled in the execution of zoomorphic ornament to find no great difficulty in rendering the rest of the design.

On general grounds of comparison it may perhaps be assigned to an early date in the sixth century.

Whether or no the Market Overton bracteate is to be regarded as an importation may be left to individual opinion. There can, however, be little doubt that the remarkable silver brooch is not of English fabric. And as in the case of the bracteate, so here it is possible to arrive at a fairly definite conclusion as to its source. The radiated brooch with semicircular head-plate has a very widespread distribution, ranging from Southern Russia to England, but the diffusion of certain types can be narrowed down to more restricted areas.

Such is the case with the Market Overton brooch (fig. 1a). Brooches of this form with five knobs like birds' beaks belong in the main to a southern branch

of the Teutonic culture, where they are of frequent occurrence.¹ The oval foot is also a distinctive southern feature, and is found in a large series of brooches, sometimes with a square head-plate. Equally southern is the form of the animal-head finial.² It is imperfect in the Market Overton brooch, but enough remains to reconstruct the rest with certainty on the analogy of well-preserved examples from Germany and elsewhere. Its particular characteristic is the presence of horizontal bars between the eyes and the nostrils, which latter in most cases are merely designated by a flat plate in place of the globular or curling nostrils familiar on Scandinavian brooches of the same period. The most noteworthy point of this brooch is, however, the ornamental designs on the semicircular head-plate and on the foot. Salin has shown that the development of the Teutonic zoomorphic ornament, to which these designs belong, lies to the credit of the northern branches of the Teutonic race, and that it spread from the north south-

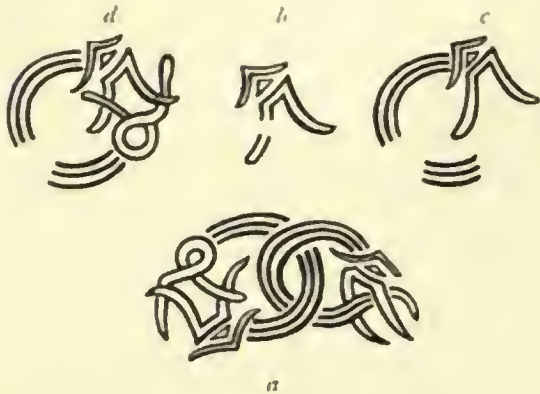


Fig. 10. Detail of design on semicircular head-plate of silver brooch from Market Overton. $\frac{1}{2}$. a. Whole design. b, c, d. Details of one animal, viz. b. head, c. head and neck, d. head, neck, and one leg.

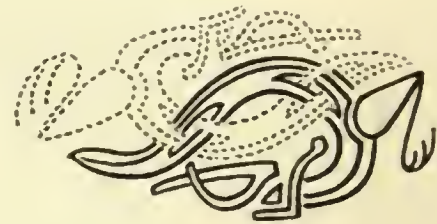


Fig. 11. Design on foot of silver brooch from Market Overton (restored). $\frac{1}{2}$.

wards, in part possibly along the lines of tribal movements such as those of the Lombards. It is not often that this class of design is so well executed in Central Europe as in the present instance. A somewhat close parallel is afforded by the large radiated brooch from Tuscany in the British Museum, figured by Kemble, *Horae Ferales*, pl. XXVIII, fig. 1. It is quite easy to distinguish two animals, both on the head-plate and on the foot (figs. 10, 11). The former pair are, it is true, incomplete; of one only the head and neck (or possibly neck and body combined), of the other the head, neck, and a loop representing one leg, are portrayed. On the foot of the brooch are two other animals; in each case the head with crossed jaws, the neck, a front leg, and the body are depicted. In both cases the animals are interlaced,

¹ Salin, *Altgermanische Tierornamentik*, pp. 36, 37.

² *Op. cit.*, p. 186.

but while on the head-plate this interlacing consists merely of entwining the bodies themselves, on the foot it is extended even to the contour lines of the bodies.

Salin, in assigning a tripartite division to his study of the evolution of the Teutonic zoomorphic ornament, relies on the fact that at the stages of its development at which he places the beginnings of his styles II and III, certain marked innovations may be observed in the execution of the design, innovations which had a far-reaching and lasting effect upon the course of evolution which the zoomorphic ornament followed thenceforth.

Thus the transition from style I to style II is distinguished by a gradually increasing predilection for interlacing two or more animals so as to produce a running or a balanced pattern, the form in which it occurs on the Market Overton brooch. But while this trait still holds good in the period of style II, and even after that, the additional feature of the interlacing of the contour lines as well is introduced. It is accompanied by certain other changes, notably in the shape of the head and the disposition of the eye. Particularly common in the Southern Teutonic area is the type of head distinguished by the sharply angled contour line at the back, with the eye set right in the angle, such as appears on the Market Overton brooch; but, as Salin remarks, it was known to the artificers who employed the canons of style I, as it is used side by side with heads of a form strictly belonging to that style. There are, then, two main points to be considered in deciding the place and the date of the fabrication of this brooch. These are the form of the brooch and its ornament. The brooch type is, as has been shown, undoubtedly a southern one. It is, moreover, the first example of a radiated brooch in which the semicircular head and oval foot are combined that has been found in England. Salin, writing in 1904, cites examples from Hungary, Bohemia, Italy, and Germany, and adds, 'von Frankreich und England kenne ich bis jetzt kein einziges Exemplar'.¹ The oval foot in conjunction with a square head-plate has a much wider diffusion; it occurs as far north as East Prussia and Hanover, and examples are known from England.² But the distribution of the other combination is quite restricted; it appears to be best known from Bavaria (*e.g.* Nordendorf) and Italy (*e.g.* Castel Trosino).³ The term 'radiated', though more strictly applicable to brooches of this form with plain knobs, is, however, not out of place as applied to such brooches as the Market Overton example, as the birds' heads are merely a more extravagant form of knob. Their employment on such brooches is practically universal in the South Teutonic area, and is not met with in the north. An interesting and perhaps late instance of their use in the south

¹ *Op. cit.*, 38. Two examples from Burgundy, France, are included in the Evans Collection (Ashmolean Museum).

² *e.g.* *V. C. H. Kent*, i, plate opp. p. 360, fig. 5; *Archaeologia*, xxx. 132, pl. xi, fig. 3.

³ *Monumenti Antichi*, xii, pl. vi-ix.

is to be seen on the gold brooch from Jouy-le-Comte, Dépt. Seine-et-Oise, France, ornamented with filigree and with cloisons set with garnets and other stones, one in the form of a fish.¹

It appears, therefore, that it is to South Germany that the fabrication of the Market Overton brooch must be assigned. The design gives the clue to its date. The end of style I in the north coincides with the end of the sixth century, and there is reason to believe that style II was introduced into South Europe at a date almost contemporaneous with its development in the north. In the Market Overton brooch the interlacement of the contour lines is not emphasized in the manner in which it commonly occurs in the north, where the separation of the contour lines begins even at their junction with the head. In this case it merely consists of a slit in the body itself, and the contour lines are interlaced at that point only. This may well represent a transition stage, and as the other details in no way exclude its ascription to the end of style I, it is probable that it need not be assigned to a later period than the end of the sixth century.

The torc, in point of form, appears to be unique among relics of the period found in this country. Continental examples of the pattern are, however, not wanting. A bronze example of similar form figured by Müller came from a grave in the island of Bornholm. It was found behind the head of a skeleton, and therefore was conjectured to have served as a diadem. But originally the form certainly belongs to the class of torcs. Müller mentions three other torcs of this type as having been found in Bornholm and Zealand.

¹ Barrière-Havy, *Les Arts industriels de la Gaule*, pl. B², fig. 6.

XXII.—*A Wardrobe Account of 16-17 Richard II, 1393-4.* By W. PALEY
BAILDON, Esq., F.S.A.

Read 6th April, 1911.

THE royal officer known as the Keeper of the Wardrobe was, we may suppose, first appointed to look after the royal clothes, but at an early date his functions were enlarged until he became one of the most important officers of the Household. I extract the following from Mr. Scargill-Bird's *Guide to the Public Records* (3rd ed., p. 246):

The King's wardrobe . . . was anciently one of the Royal Treasuries into which certain portions of the revenues of the Crown were paid, and from which disbursements were made, as well for military and naval as for civil and domestic expenses. It represented, in fact, with regard to the expenditure of the State, a group of government offices comprising an Admiralty, War Office, Foreign Office, and Lord Chamberlain's department, and including the functions of a Keeper of the Privy Purse. According to the author of *Fleta*, to the Treasurer of the Wardrobe were committed the expenses of the King and his family, and in conjunction with a Clerk of the Wardrobe, who was associated to him as comptroller, he was to keep a record of whatever belonged to his office. He was to keep the King's money, jewels, gifts, and private receipts, and to make a separate roll thereof, to be returned annually into the Exchequer. In another roll were to be entered the daily and necessary expenses, which comprised the buying of horses and carriages and many other articles; also gifts, alms, and oblations; the wages of knights and archers; the wages of messengers, and foreign fees, presents, or accommodations; and the expenses of the wardrobe, including the buying of cloth, furs, wax, spices, linen, and such like; together with purchases of jewels, &c., goldsmiths' work, and the wages of the royal falconers and huntsmen.

From this account it will be seen what a very wide field is covered by the records of the Wardrobe, which begin in 14 John, 1212-13. Very few of them have been published; this Society printed one for 28 Edward I, 1299-1300, as far back as 1787. They are full of interest, and the Fellows will remember that the identification of the celebrated Gold Cup, now in the British Museum, and many details of its history, were obtained from these records.

The present document covers the period from April 24, 1393, to April 23, 1394. It was found by a friend of mine among a lot of Court rolls he was

examining in a private muniment room in the Midlands. He called my attention to it, and as it is not available to the public, I obtained permission to copy it. It deals mainly with the original functions of the wardrobe, that is, with clothes and materials, but has some information about jewellery, arms, and accoutrements.

I propose to divide my notes into (1) persons, (2) jewellery, &c., (3) arms, &c., and (4) materials and costume.

PERSONS.

The King himself is mentioned frequently in connexion with various articles, but there is little of personal interest. He had some new scarlet hose for a journey into Wales, and a short scarlet gown made for St. George's Feast. He appears to have been fond of jousting, since several payments were made in connexion with that sport, which seems rather out of keeping with one's preconceived notions of his character and habits. Hunting-gowns were made for him and some of his friends, and his hunting-knives are mentioned. Some very curious garments made for him to wear at a masque or other festivity will be mentioned later.

The Queen, Anne of Bohemia, is only mentioned once, in connexion with the repair of a collar and certain other things.

Among other members of the Royal Family referred to is the Duke of York, Edmund of Langley, the King's uncle, for whom a *jupe* of blue velvet doubled with white tartarin was made at a charge of 2s. 6d.

A long gown of scarlet, given by the King to the Earl of Marche, cost 18d. to make, and a gold chain was made for the Countess of Marche at a cost of 4s. 4d. The Earl was the King's second cousin.

Nine knights are mentioned.

A saddle covered with cloth of gold, late belonging to Sir John Devereux, was bought for £5 6s. 8d.

Nine hunting-gowns of green cloth were made for the King, Sir George Felbrigge, Sir Simon Felbrigge, Sir Stephen le Scrope, Sir John Lutelbury, Sir Philip la Vache, Sir William le Scrope, the chamberlain, Sir William de Arundell, and Sir Thomas Mortimer. These gowns cost £4 10s. 3d. Sir George Felbrigge also had a piece of cloth of gold, with golden lions on a ground of white and black, and some fur of bys. Sir Baldwin Radyngton had a short coat of Kendal cloth.

The only other person who calls for special remark is a certain Nikill Henxtman. His whole outfit seems to have been provided: boots, hose, leggings, linen sheets, coats, doublets, and gowns, including a long gown of the livery of the grooms of Monsieur del Marche. I have not identified this individual, but

I think he may have been the Court fool or hunchback. The gown like those of the Earl of Marche's grooms suggests that Nikill was lent for some festive occasion.

JEWELLERY, &c.

There is not a great deal to note under this head, but there are some items of interest; they nearly all occur in the bills of Wynald the Goldsmith.

He charged 12*d.* for mending a gold ring containing *lignum dominicum*, which must, I think, mean a piece of the Holy Cross, though it is not quite clear.

Richard's badge of the White Hart appears several times. A collar of the Queen's livery, a brooch, and a hart of 'cokill' were repaired at a cost of 3*s.* Cokill is used for shell of any kind, and probably means mother-of-pearl. A gold hart set with stone (*petra*) and pearls cost 33*s.* 4*d.* *Petra* is evidently some kind of stone for which the clerk had no special name, as, for instance, a piece of malachite on which the hart was 'lodged'. Mending and re-enamelling two gold harts cost 26*s.* 8*d.*

A gold chain for the Countess of Marche cost 3*s.* 4*d.*

ARMS.

Arms and armour must have come into some other account, there is so little here.

Jousts are mentioned incidentally. Mending a saddle for the jousts at Christmas last, with a stuffed pillow and red leather for covering it, cost 20*d.*; leather harness and making two *frendes* for the jousts cost 2*s.*; two surcingles of twine with double threads and large buckles and thongs, for the jousts, cost 10*s.* Mending a jousting saddle, with a new pillow, &c., cost 2*s.* 6*d.*

Spurs. Engraving and gilding a pair of spurs cost 10*s.* Two pair of latten spurs, prepared with white and green, cost 6*s.* 8*d.*

A baslard garnished with lockets of silver-gilt and a hilt of murret cost 20*s.* Another with silver-gilt lockets and chape cost 17*s.* A third, garnished with silver, given to Edward Standissh, cost 12*s.*

A chape and a pendant for a sword, the silver being found, and gilding the same, cost 12*s.* 7*d.*

A pair of coffers for keeping armour in cost 16*s.*

Bows and arrows. A round bow cost 2*s.* 4*d.*, eight bolts for the same 14*d.*, two dozen cords for bows 13*d.*, and a glove for drawing the bow (*ad tractandum*), 2*d.*

A hutch of cardboard, to keep bows in, cost 12*d.*

A leather case for bolts cost 3*s.* 4*d.*

A pair of gloves, apparently for archery purposes, cost 2*d.*; twelve bolts 2*s.*

ACCOUTREMENTS.

Three harnesses, with cruppers, poytrels, and reins, studded with long bars of latten, and the crup with six pendants, and the joints and pendants with great bosses of latten, and great cignets [*? seynettes*] within, cost £4. These were evidently the open-work trappings which we see so frequently on the hind-quarters of horses in illuminated MSS. of the period. Broad straps arranged diagonally, crossing at right angles, with bosses at the intersections and swans in the spaces. As I understand the entry, each harness had six pendants; it is unfortunate that they are not more fully described.

MISCELLANEOUS ARTICLES.

Points cost 3*d.* a dozen, others 6*d.* a dozen; they were bought in considerable quantities.

A collar garnished with harness of latten, for the lord's greyhound, cost 14*d.*

Gilding the belt, locket, and other harness of a hunting-knife cost 6*s.* 8*d.*, white leather for the belt 4*d.*; making a chape for the knife and a pendant of white and green for the belt, with gold for the same, cost 5*s.* 11*d.*

Two little bells for the lord's great belt cost 16*d.*

A pair of 'patyns' for the lord, 4*d.*

A little coffer for trussing the lord's jewels cost 13*d.*

Two brushes cost 7*d.*

A case for combs cost 2*s.* 8*d.*, and a pair of scissors and a mirror for the case cost 12*d.* and 5*d.* respectively.

A saddle for the lord's mails cost 12*s.*

MATERIALS.

Both in material and colour Richard's tailors had a large variety to choose from.

Cloth of gold was red, white, blue, and black.

Velvet was white, green, blue, black, and red.

Silk was green and white.

Satin was white only.

Cloth was black, scarlet, white, green, violet, sanguine, and blue.

Tartarin was black, green, and white.

Cloth of damask was black and green.

Taffeta was green only.

Buckram was black only.

Frieze was sanguine, green.

Ray, a striped material, is generally described by reference to its ground, which was sanguine, green, russet, powdered.

Fustian was white only.

Other materials were Brabant cloth, Kendal cloth, brown russet, blanket, blanket cloth, 'soupedevyn', 'red faldyng', 'black streit', black kersey, linen cloth of 'reynes', and 'westfall'.

The prices vary in a most remarkable way, showing a large range of qualities. The price of cloth of gold is not given; perhaps it was not sold by the yard. Red velvet cost 13s. 4d. the yard, and the best scarlet cloth 12s.; sanguine cloth 10s. 6d., white velvet 8s., white satin 6s. 9d. Linen and Brabant cloth were sold by the ell; silk was sold by the ounce, and thread by the pound. The lady who sold silk is called the 'silk-wife', corresponding to the more familiar ale-wife and fish-wife.

The furs, used largely for trimming, were ermine, minever, bys, budget, gray, cristy gray, and calabre. Bys was the most expensive, costing 18s.; the 'furrure', cristy-grays were 8s. 4d. each, budgets 4s. each, lamb skins 1s. 10d., ermines and minevers 14d. each; while backs of fine gray were only 2½d. each.

COSTUME.

The garments mentioned are gowns, hose, doublets, short gowns, sleeves, which appear in many cases to have been detached, cuffs or wrist-bands (*manicae*), boots and shoes, leggings, whalebone pikes, shirts, hunting-gowns, breeches (*bracce*) once only, 'bodies', 'jupes', hoods, collars, 'straight garments', 'hancelins', dancing doublets, long cloak, hats. Most of these do not call for comment, and I propose to mention only a few.

The jupe has a curious history. Both word and garment are Arab in origin. The *jubbah* or *jibbah* was and is a long loose outer garment of white material worn as a protection against the sun, especially over armour. The garment was adopted by the crusaders, and as they had no name for it they called it as the Eastern folk did. In Spanish this became *aljubah* (with the article prefixed as in alchemist, &c.), in Italian *juta*, and in French *jupe*, which was the form adopted in English. The garment first appears in England on military brasses of the late thirteenth century. The brass-rubbing fraternity have invented three names for it: the original long loose form they call a 'surcoat', a later and shorter form they call a 'cyclas', while in its last abbreviated pattern they dub it a 'jupon'.

The early surcoat was a long loose sleeveless garment, worn over armour, and reaching well below the knees. Originally it appears to have been quite plain, but early in the fourteenth century it was embroidered with the wearer's

arms. About 1325 it became shorter, not reaching below the knees—this is the form known as the *cyclas*; it was closer fitting about the body, but sometimes has a fullness below the waist, giving the effect of a skirt. The later *jupon* was a still shorter and closer-fitting form of the *cyclas*, reaching to mid-thigh only, losing the skirt-like appearance, and apparently fitting fairly tightly round the thighs. It came in about 1350, and disappears from brasses and monuments early in the fifteenth century, but remains in glass windows much later. The heraldic *jupon* as an article of ladies' wear is seen frequently in windows of the fifteenth century; I do not remember any examples on brasses or effigies, but should not be surprised to hear that there are such. The nomenclature used by various writers is very confused, since almost each one has his own pet names for things. Thus, many writers speak of the 'sleeveless cote-hardie' worn by women, but that is really a *jupe*. The coat had sleeves, the *jibbah* and its derivatives had none, and they were thus the more easily put on over the coat, hence *surcoat*. It is probably owing to this fact that the English for *jupe* is small coat, petticoat. I cannot say precisely when the *jupe* was first used by persons not wearing armour. It is frequently seen in MSS. of the late fourteenth and early fifteenth centuries, with the sleeves of the coat or doublet thrust through the shoulder apertures of the *jupe*, which was generally of a different colour. It is a garment of this description that occurs so frequently in this wardrobe account. No fewer than fourteen are mentioned, two of which were of cloth of gold, and we must conclude that they were the height of fashion for the moment. The subsequent history of *jupe*, word and garment, is distinctly curious. Most articles of underwear of both sexes started as outer garments. Thus, the shirt and (*rubesco referens*) the chemise are descendants of the Saxon outer garment, the smock. New and fashionable articles of attire are naturally worn outside, where they can be seen and admired, and so the older and more primitive garments pass gradually, often very gradually, to a modest and unseen retirement. Some unknown Beau Brummel of an early date must have taken it into his head some fine morning to wear his sleeved coat over his sleeveless *jupe* or petticoat, thereby setting a new fashion. The long waistcoat of late Stuart times is the *jupe* worn in this way, and the modern garment, which the wearer calls a waistcoat and the maker (for some mysterious reason) a vest, is the same thing cut short at the lower edge. It will thus be seen that while man has retained the upper part of the *jupe* or petticoat, he has surrendered the name and the lower portion to his women-folk. St. Martin divided his cloak vertically; the *jupe* was dimidiated horizontally. If you look at the *jupons* on the well-known Hastings brass at Elsing you will see, as I mentioned just now, that they are all pleated into a fairly full skirt below the waist; cut off the upper portion, and you have left the *jupe* or petticoat, rather short, it is true, of the illustrated paper advertisements and the Great White Sales.

The *Historical English Dictionary* gives quotations for the use of the word petticoat, as meaning a man's waistcoat, in 1674 and 1736.

Two garments, described in detail, are the gems of the collection, a dancing doublet and hanselyn,¹ of which we can piece together a very minute description, made for the festivities at Christmas. They were made of white satin, costing 5s. 9d. a yard, and took nine yards between them. The cost of making was 14s. for the hanselyn and 4s. for the doublet. £6 was paid for embroidering the hanselyn with leeches, water, and rocks; it was embellished with fifteen whelks and fifteen mussels of silver gilt, and fifteen cockles of white silver. The doublet was embroidered with gold orange trees at a cost of £5, and adorned with 100 oranges of silver gilt, weighing 2 lb. $\frac{1}{2}$ oz. Troy. The total cost of these two garments was over £24. Probably connected with the costume were thirteen pairs of hose, of black and white, and green and white, made for Christmas, green and white silk fringe, and possibly a gown of green damask embroidered with a band and cuffs of hops, which cost £4.

The constant recurrence of green and white, which is well shown here, suggests that they were Richard's livery colours, for the moment at any rate, but I do not find them recorded as such.

WARDROBE ACCOUNT FROM APRIL 24, 1393, TO APRIL 23, 1394.

Garderoba ab in crastino Sancti Georgii Martyris, anno regni Regis Ricardi Secundi post conquestum xvjmo, usque idem festum proximum sequens, anno xvijmo, per unum annum integrum.

*Johannes Creke.*²

In j virga iij quarteriis panni nigri pro caligis domino faciendis, precium virge iiij s.,		vij s.	
Item pro factura iij parum caligarum de dicto panno cum linea tela,		ij s.	ijd.
Item pro itinere domini usque Walliam, j virga j quarterium scarleti pro caligis, precium virge x s.,		xij s.	ixd.
Et pro j virga j quarterium panni albi, precium virge v s., ad partendi cum predicto scarleto,		vij s.	vjd.
Et pro j virga j quarterio panni viridi, precium virge iiij s.,		vs.	
Et pro j virga j quarterio de panno albo, precium virge iiij s.,		vs.	
Et pro tela linea pro dictis viij paribus caligarum,			xxd.
Et pro factura earundem,		iiij s.	
Item contra festum sancti Georgii, pro iij virgis scarleti pro j gowna facienda usque ad mediam tibiam, precium virge x s.,		xxxij s.	
Et pro iij virgis de panno nigro pro duplicacione ejusdem goune, precium virge iij s. viijd.,		vij s.	
Et pro j virga j quarterio scarleti pro manicis duplicatis, precium virge x s.		xij s.	ixd.

¹ The hanselyn was a loose outer garment of some sort; Chaucer (*Parson's Tale*) speaks of 'kutted sloppes or haynselynes'.

² The names printed in italics are written in the margin of the roll.

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Et pro vj virgis panni viridi pro j gowna facienda ad mediam tibiam, precium virge iijs.,	xxiijs.	
Et pro j virga j quarterio scarleti pro caligis faciendis, precium virge xjs.,	xiijs.	ixd.
Et pro j virga j quarterio de albo panno, precium virge vjs.,	vjs.	vjd.
Et pro j virga j quarterio panni viridi, precium virge iijs.,	vs.	
Et pro j virga j quarterio de albo panno, precium virge iijs.,	vs.	
Et pro ij ulnis linee tele pro dictis viij paribus caligarum liniendis,		xxd.
Et pro factura predictarum viij parum caligarum,	iijs.	
Et pro ij virgis panni nigri pro caligis et manicis, precium virge iijs.,	vijjs.	
	vijfd. ix.	ixd.

Penston.

Et pro j ulna linee tele pro eisdem caligis liniendis,		xd.
Et in vij duodenis punctuum, precium duodene iijd.,		xxjd.
Et in filo et sapone emptis pro garneamentis,		ijd.
	ijs.	ixd.

Wynald, aurifaber.

In emendacione j anuli aurei habentis lignum dominicum inclusum,		xijd.
Item in emendacione j colere de liberacione domine Regine, j nouch et j cervi de cokill,	vs.	
Item pro factura et opere j cervi aurei cum petra et perles impositis,	xxxiijs.	iiijd.
Item pro imposicione j harnesii pro zona super uno novo tissue viride et albo,		viijd.
	xls.	

G., cordewaner.

In ij duodenis et v paribus sotularibus boteux et chaussimlez, precium parium vijd.,	xvjs.	xjd.
In j pari ocrearum pro domino,	iijs.	iiijd.
Item pro clapsis [<i>sic</i>] ad easdem,		xxd.
Item in ij paribus pykes de baleyn,		xxd.
In j pari sotularum pro Nikill Henxtman,		iiijd.
Item in emendacione ocrearum pro eodem,		vjd.
	xxiijs.	vd.

Penston.

In dimidia virga dimidio quarterio velveti albi pro j manicis [<i>sic</i>] goune domini,	vs.	
In ij ulnis tele Flandrensis pro linura j doubelet pro domino,		xxijd.
In dimidia virga et j clavi tartarini nigri pro manicis j goune panni nigri,		xxd.
In viij virgis bokeram nigram, precium virge xijd., pro linura predictae goune,	vijjs.	
In xiiij virgis de taffeta viridi, pro linura j goune date magistro Johanni Middelton, precium virge viijd.,	ixs.	iiijd.
In dimidia ulna tele de Reynes pro pulvinario domini cooperiando,		xviijd.
Item in ij virgis j quarterio fustien pro eisdem emptis, precium virge viijd.,		xviijd.
	xxviij.	xd.

Willelmus Charneye.

In j nova cella pro mala domini cum toto apparatu,	xijjs.	
In j novo panello pro j cella sommaria,	ijjs.	
In j pari de reynes pro j freno pro mala cum ij bokeles,		iiijd.

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Item in emendacione j celle pro hastiludiis contra Natalem Domini proximum preteritum per prius non computatum propter defectum parcelle cum j pilwe stuffato et la stuff cooperato cum coreo rubro,		xxd.
Item pro coreo harnessii [pro] hastiludiis et pro factura ij frendes,	ijs.	
Item pro ij soursengles de twyn cum tela duplicatis et boucles grossis et thonges pro hastiludiis,	xs.	
	xxvijs.	

J. Creke.

In j virga j quarterio panni nigri pro ij paribus chaux simlez faciendis, precium virge iijs.,	vs.	
In dimidia ulna linee tele pro eisdem,		vd.
In factura predictarum ij parium chauxsimlez,		xijd.
Item pro factura iiij parium caligarum pro domino,	ijs.	
Item pro j ulna panni linei empta pro eisdem caligis,		xd.
	ixs. iijd.	

IV. Wilteschire.

In vj dorsis de grey fyn expensis in colera et manicis j goune panni nigri, presium dorsi, ijd. ob.,		xvd.
Et pro opere circa eandem gownam furrandam,		xvjd.
In iiij ermyns expensis in purfyle et manicis j goune panni auri rubei, precium pecii xiiijd.,	iijs.	viijd.
Et pro operatione furrure ejusdem goune		xvjd.
Item in iiij ermyns expensis in purfile colere et manicum j goune de velvet, precium pecii xiiijd.,	iijs.	viijd.
Et pro operatione furrure ejusdem goune,		xvjd.
	xiijs. vijd.	

Penston.

In iij ulnis j quarterio linee tele de reynes pro pannis lineis pro domino faciendis, precium ulne ijs.,	ixs.	ixd.
In factura ij camisium pro domino de eodem panno,		vd.
	xs. ijd.	

G. Reynald.

In j cella nuper domini Johannis Devereux cooperta panni auri, empta de Gruff[ith] Reynald,	106s.	viijd.
	106s. viijd.	

Penston.

In vj virgis dimidia tartarin viridis pro linura j goune viridis longe pro domino, precium virge ijs. viijd.,	xvijs.	iiijd.
Item in ij virgis j quarterio fustien pro j doubelet pro domino faciendo, precium virge viijd.,		xviijd.
In j ulna et dimidia linee tele pro linura ejusdem doublett, precium ulne xd. ob.,		xvd. ob.
	xxs. jd. ob.	

J. Creke.

In iij virgis dimidia panni viridi emptis et datis Magistro Johanni Middleton per dominum, precium virge iijs. xd.,	xiijs.	vd.
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In dimidia virga dimidio quarterio panni nigri et dimidia virga dimidio quarterio panni albi pro caligis faciendis domino,	viijs.	
In dimidia ulna linee tele pro ij paribus caligarum liniendis,		vd.
In factura ij parium caligarum de panno predicto,		xijd.
Item in xxv virgis iij quarteriis panni viridi emptis, precium virge iij <i>s.</i> vjd., plus in toto jd. ob., et dividitur pro ix gownis venaticis datis per dominum, videlicet, j gowna pro seipso, j pro Georgio Felbrigge, j domino Simoni Felbr[igge?], j domino Stephano Lescrope, j domino Johanni Lutelbury, j domino Philippo la Vache, j domino Willelmo le Scrope, camerario, j domino Willelmo Darundell, et j domino Thome Mortymer,	iiij <i>li.</i>	xs. iij <i>d.</i>
In j virga j quarterio panni viridi et j virga j quarterio panni albi pro caligis, precium virge iiijs.,	xs.	
In j ulna linee tele empta pro linura iij parium caligarum predictarum,		xd.
Item in factura dictarum iij parium caligarum pro domino,	ij <i>s.</i>	
	vj <i>li.</i> vs. xjd.	

W. Croumere.

Item in iij virgis panni viridi pro j goune [<i>sic</i>] facienda pro domino, precium virge iiijs.,	xvjs.	
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Swynmour.

In j arcu rotundo empto pro domino ijs. iiij <i>d.</i> ,	ij <i>s.</i>	iiij <i>d.</i>
In viij boltes emptis pro eodem,		xiiij <i>d.</i>
In ij duodenis cordis pro arcubus emptis,		xiiij <i>d.</i>
In j cerotheca ad tractandum empta pro eodem,		ij <i>d.</i>

J. de Camera.

In j houe de cardeblod empt pro arcubus domini imponendis,		xijd.
Item in cordis emptis pro arcubus domini,		ij <i>d.</i>
In j virga dimidio quarterio panni nigri emptis apud Sarum pro caligis pro domino faciendis,	iiijs.	xd.
	xxvjs. xd.	

Totalis xxx*li.* vijs. iij*d.* ob.

J. Creke.

Item in di. verge di. quart. de drap noir pour chauxsembles,	iiijs.	
Item pour di. verge di. quart. de drap blank,	iiijs.	
Item pour facion de ditz ij pare chauxsembles,		xijd.
Item pour toille as ditz ij pare chauxsembles,		vd.
Item pour j verge j quart. de drap verd pour chaux, pris la verge iiijs.,	vs.	
Item pour j verge j quart. de drap blank pour parter, pris la verge iiijs.,	vs.	
Pour toille pour iij pare chaux,		xd.
Item pour faciun de iij pare chaux,	ij <i>s.</i>	
Item pour dimi verge dimi quartier de drap noir pour chaux,	ij <i>s.</i>	vjd.
Item pour dimi verge dimi quartier de drap blank pour partier,	ij <i>s.</i>	vjd.
Item pour toille pour ij pare chaux,		vd.
Item pour facon de ij pare chaux,		xijd.
Item pour dimi verge dimi quartier de drap verd pour chaux,	ij <i>s.</i>	vjd.
Item pour dimi verge dimi quartier de drap blank pour partier,	ij <i>s.</i>	vjd.

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Item pour toille de ij pare de chaux,		vd.
Item pour facon de ij pare de chaux,		xijd.
Item pour dimi verge dimi quartier de drap verd pour chauxsemblez,	ijs.	vjd.
Item pour dimi verge dimi quartier de drap noir pour chaux,	ijs.	vjd.
Item pour dimi verge dimi quartier de drap blank pour partier,	ijs.	vjd.
Item pour toille de iij pare de chaux,		vijd.
Item pour facon de iij pare de chaux,		xviijd.
Item pour dimi verge dimi quartier de drap noir pour chauxsemblez,	iijs.	
Item pour dimi verge dimi quartier de drap blank pour partier,	iijs.	
Item pour toille de ij pare chaux,		vd.
Item pour facon de ij pare de chaux,		xijd.

liiij. j*d.*

Item in j pari ocrearum empto pro Nikill Henxtman apud Hampton cum clapsis pro cisdlem,	ijs.	iijd.
	ijs.	iijd.

Penston.

In iiij duodenis punctuum emptis pro domino,		xijd.
In j collara garnis' cum hernesio de auricalco pro leporario domini,		xiiij <i>d.</i>
In xxvj crochettis emptis pro camera domini,		xijd.
In j ulna j quarterio panni de Braban pro braccis pro domino faciendis,		xvj <i>d.</i>
In factura v braccarum de eodem panni,		ij <i>d.</i>
In iij virgis et dimidia panni nigri pro linura j goune de sanguino frisia una cum dagges et j bende pro eadem gouna, precium virge iij <i>s.</i> ,	xs.	vjd.
	xvs.	ij <i>d.</i>

Wynald aurifaber.

In emendacione ij ollarum argenti quarum quelibet continet dimidiam lagenam,		xijd.
Item in j labro auri facto pro j zona domini, ponderans ad valorem auri,	ijs.	viijd.
Item in deauratione j cultelli venacionis, videlicet, zone, loket, et alii harnesii,	vjs.	viijd.
Item pro coreo albo pro zona dicti cultelli,		iiij <i>d.</i>
Item pro factura j chape dicti cultelli et j pendant ad zonam de albo et viridi, plus ponderans quam vetus harnesium per ijs. vij <i>d.</i> , cum factura et auro ad idem x <i>d.</i> ,	vs.	xjd.
Item in ij campanellis ad magnam zonam domini, ponderans,		xvijd.
	xvijs.	xjd.

Crowmere.

Item pro iij virgis iij quarteriis de broun russet, precium virge vs.,	xviij <i>s.</i>	ix <i>d.</i>
Item pro iiij virgis de sangwyn frisato, precium virge ijs.,	viijs.	
	xxvjs.	ix <i>d.</i>

J. Sporiere.

Item pro sculptura et deauratione j parium calcarium,	xs.	
Item pro ij paribus calcarium de laton apparatorum cum albo et viridi, precii paris iij <i>s.</i> iiij <i>d.</i> ,	vjs.	viijd.
Item pro apparacione j paris calcarium de laton,		xx <i>d.</i>
Item pro apparacione j paris calcarium nigrorum apparatorum cum laton,	ijs.	
	xxs.	iiij <i>d.</i>

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Selkwyffe, Matilda Baleye.

Item pro j corps de albo et viridi serico pro le waste, ponderans ij uncia j quarterium et dimidia, precium uncie xxijd.,	iijs. iiijd. q.
Item pro j corps de albo et viridi serico longitudine j virge et dimidie, ponderans ij uncie et dimidia et dimidia quarterii, precium uncie xxijd.,	iijs. ix d. ob. q.
Item pro iij quarteriis filii Londonie,	xviijd.
Item pro j uncia de serico Londonie,	xiiijd.

Johan Otley. Liberatio domini contra Natalem Domini.

Item in ij pannis aurei, campo albo et nigro, cum leonibus auri, pro domino et domino Georgio Felbrigge emptis,	ix li.
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Butterley.

Item in ix virgis radiati campo sanguineo et vij virgis et dimidia panni violetti emptis pro liberatis iij scutiferorum, precium virge utriusque xxjd.,	xxvijs. xd. ob.
In xxj virgis radiati campo viridi et xv virgis panni blonketti, precium virge utriusque xix d., pro vij valettis,	lvjs.
In xv virgis radiati campo poeree et pro x virgis soupedevyn, pro vj garcionibus, precium virge xvjd.,	xxxiijs. iiijd.
In viij virgis radiati campo russeto, pro ij pages, precium virge xiiijd.,	ixs. iiijd.
Item in iij virgis panni blodii emptis pro liberata Johannis de Kepston, clerici, precium virge iijs. iiijd.,	xiijs. iiijd.
xvj li. xiijs. viijd. ob.	

J. Asshele, sherman.

In tonsura panni pro liberata domini ut supra, continente iij pannos et dimidiam et j virgam, quolibet pannus continens xxiiij virgas, capiens per pannum xvd.,	iijs.
Item in batellagio Johannis de Kepston et Johannis Penston inter Lon- donium et Westmonasterium per diversis vicibus pro dicto panno liberato emendo una cum portagio ejusdem panni,	xx d.
vs. viijd.	

Wyldschiere.

Item in j furrura de bys empto pro liberata domini Georgii de Felbrigge,	xvijs.
Item in x furruris agnorum emptis pro liberatis scutiferorum et valle- torum, precium furrure xxijd.,	xvijs. iiijd.
Item in j furrura boget empti pro liberata Johannis de Kepston, clerici, xls. iiijd.	iijs.

Penston.

Item in ij paribus pannorum lineorum emptis pro Nikcil Henxtman,	xx d.
Item in furbiacione j cultelli venatici et unius gladii domini cum vaginibus ad eosdem de novo facta [sic],	ijs. ijd.
Item in j baselard garniso cum lokettis argenteis deauratis cum manubrio de murret pro domino empto per Standissh,	xxs.
xxiijs. xd.	

Georgius Cordewaner.

In xxxij paribus sotularum emptis pro domino, precium paris vij <i>d.</i>	xviij <i>s.</i>	vii <i>d.</i>
In vij paribus de pykes de baleyne emptis pro domino,	vs.	xd.
Item in j paire de chauxsymelez, j paire de boteux et ij paire de soilers,	ijs.	iiij <i>d.</i>
Item in cordulis emptis pro arcubus domini,		ii <i>d.</i>
In j caas corei empto pro peculionibus domino imponendis, emptis per Swynmour,	iijs.	iiij <i>d.</i>
xxxx <i>s.</i> vd.		

Houeden.

Pro factura j jupe duplicate usque ad dimidiam tubiam de panno nigro,		xviij <i>d.</i>
Item pro factura j capucii de panno nigro,		vii <i>d.</i>
Item pro factura j pari manicarum duplicatarum de predicto panno nigro,		v <i>d.</i>
Item pro factura j jupe de ray duplicate cum blanketo simili cum j capucio duplicato pro j garg,		xij <i>d.</i>
Item pro factura unius jupe usque ad medietatem tubie de rubeo panno de auro,	ijs.	v <i>d.</i>
Item pro factura colere unius viridis velveti cum dimidia manica de albo velveto embroudato,	ijs.	
Item pro factura j jupe usque ad dimidiam tubiam de scarleto duplicate cum panno nigro,		xviij <i>d.</i>
Item pro factura j jupe duplicate panno viridi usque ad dimidiam tubiam,		xviij <i>d.</i>
Item pro factura ij parium manicarum de scarleto duplicatarum,		xij <i>d.</i>
Item pro factura j garneamentis stricti de albo fustien de liberata Montegew,	iijs.	
Item pro factura j jupe sengle de viridi ray partite cum viridi panno pro Nikell,		xij <i>d.</i>
Item pro factura j jupe longe de panno nigro duplicate cum nigro boke-ram de liberata regis et manicarum duplicatarum cum nigro tartarin,	ijs.	
Item pro factura j doublett de nigro panno de Damasco,	iijs.	
Item pro factura j jupe usque ad dimidiam tubiam de blodio velveto duplicate cum albo tartaryn de liberata Ducis Eboraci,	ijs.	v <i>d.</i>
Item pro factura j jupe viridis et melioris viridi cum j bende sengle,	ijs.	v <i>d.</i>
Item pro factura j jupe longe de viridi panno duplicate cum viridi tartaryn et j capucio [<i>sic</i>] duplicato,		xviij <i>d.</i>
Item pro factura j jupe de panno de Kendale de liberata domini Baldewyni Radington,		xv <i>d.</i>
Item pro factura j doublett de albo fustien sine manucis,	ijs.	
Item pro factura j jupe usque ad dimidiam tibiam de albo panno de auro,	ijs.	v <i>d.</i>
Item pro factura j jupe de frise cum j bende de albo et nigro, duplicate cum nigro,	ijs.	
Item pro factura j jupe de russet,		xviij <i>d.</i>
xxxix <i>s.</i>		

Penston.

In pari de patyns emptis pro domino,		iiij <i>d.</i>
In j doublett de fustein empto [pro] Nikell Henxtman,	iijs.	vii <i>d.</i>

Symme.

In j zona empti pro domino,		iiij <i>d.</i>
Item in ix virgis de satyn albo emptis pro j hancelyn et j tunica ad tripudium pro domino contra Natalem,	l <i>s.</i>	vii <i>d.</i>

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In factura j cathene auri pro domina Comitissa Marchie cousorte domini,		
una cum auro eadem imposito ad valenciam <i>xd.</i>	iijs.	iiij <i>d.</i>
Item in j parva cofre empta pro jocalibus domini trussandis.		xiiij <i>d.</i>

lxjs. *vd.*

Houedene.

Pur la facion d'une longe goune de scarlet, oue un chaperon double,		xviiij <i>d.</i>
Item j goune de rouge frise line oue blankett a Nikell,		xij <i>d.</i>
Item pur le garnishire d'une pylch,		iiij <i>d.</i>
Item pur le facion d'une goune tanque a dimi jambe de ray frise, partie		
oue verd frise, lyne de blanket,		xviiij <i>d.</i>
Item j doublett de blank fustien pur Nikell, pur la facion,		xvj <i>d.</i>
Item j goune a dimi jambe de rouge drap d'ore,	ijs.	vj <i>d.</i>
Item j goune tanque a dimi jambe de noir et blank drap d'ore,	ijs.	vj <i>d.</i>
Item pur amendement d'une garnement de noir et rouge velvet oue		
losenges,		vj <i>d.</i>
Item pur facion d'une longe goune del livere des gromes Mounsieur del		
Marche, lyne oue blanket pur Nikel,		xij <i>d.</i>
Item j longe goune de scarlet, de donne le Roy pur Mounsieur del Marche,		xviiij <i>d.</i>
Item j longe goune de vierd drap de damask, del donne de Roy,	ijs.	vj <i>d.</i>
Item j longe goune de blu drap d'ore,	ijs.	vj <i>d.</i>
Item j longe cloche de meisme le drap,	iijs.	iiij <i>d.</i>
Item pur j doublett de pleyn blank fustien, oue manches d'altre fustien,	iijs.	
Item pur j court goune de rouge drap d'ore, del donne le Roy,	ijs.	
Item pur j hancelet de blanc satyn embroude,	xiijs.	
Item pur j daunsyng doublet de blanc satyn embroude,	iijs.	
Item pur j doublet, le corps de rouge drap d'ore et les manches de rouge		
velvet,	iijs.	
Item pur j chapon de blu velvet,		iiij <i>d.</i>
Item pur chaperon de noir drap,		iiij <i>d.</i>

xlxs. viij*d.*

Johan Creke.

Pur dimi verge dimi quartier de drap noir, le xxvj jour d'Octobre, pur		
chauxsemblez, pris du tout,	iijs.	
Item meisme le jour, pur dimi verge dimi quartier de blank, pur partier,	iijs.	
Item pur facion de ij paire chauxsemblez, noir et blank,		xij <i>d.</i>
Item pur toille pur lez ditz chaux,		<i>vd.</i>
Item pur iiij verges de scarlett pur j longe goune, pris la verge xijs.,	xlviijs.	
Item pur ij verges j quartier de rouge faldyng pur j page, pris la verge xiiij <i>d.</i>	ijs.	vj <i>d.</i>
Item pur ij verges et dimi de blankett pur lynyng, la verge a vj <i>d.</i> ,		xxj <i>d.</i>
Item pur j quartier de noir et blank pur dagges del goune le dit page		vj <i>d.</i>
Item le primer jour de Novembre, pur dimi verge dimi quartier de noir		
pur chauxsemblez,	iijs.	
Item meisme le jour, pur dimi verge dimi quartier blank pur parter,	iijs.	
Item pur la facion des ditz ij paire chauxsemblez,		xij <i>d.</i>
Item pur toille as ditz ij paire chauxsemblez,		<i>vd.</i>
Item le vij ^{me} jour de Novembre, pur ij verges et dimi de streit noir pur		
ij paire chaux, la verge ijs.,	vs.	
Item pur facion des ditz ij paire de chaux,		xij <i>d.</i>
Item pur toille as ditz ij paire chaux,		<i>vd.</i>

Item le xij jour de Novembre, pur iij verges de scarlett quex feurent donez a Richard Wegge, pris la verge ix <i>s</i> . vjd.,	xxvijs.	vjd.
Item le primer jour de Decembre, pur ij verges iij quartiers noir pur chaux encontre Nowel, la verge v <i>s</i> . iiij <i>d</i> .,	xv <i>s</i> .	xd.
Item meisme le jour, pur j verge j quartier verd pur chaux, la verge a v <i>s</i> .,	v <i>s</i> .	iijd.
Item meisme le jour, pur j verge j quartier blank, pris la verge v <i>s</i>	v <i>s</i> .	iijd.
Et pur ij verges iij quartiers blank pur parter ovesque le noir et verd, la verge a v <i>s</i> . iiij <i>d</i> .,	xvijs.	vd.
Item pur facion de xiiij paire de chaux de noir et blank et verd et blank, encontre le feste de Nowell,	v <i>s</i> .	vjd.
Item pur toille pur les ditz xiiij paire chaux,	ij <i>s</i> .	viijd.
Item pur iiij verges et dimi de scarlet pur David Vaghham, William Assh. John Herberger et William Herte, la verge a x <i>s</i> .,	xl <i>s</i> .	vjd.
x <i>li</i> . x <i>s</i> .		

W. Venne.

Item pur j chape et pendant d'une espeie, as queux l'orfeverer trova d'argent a la somme de ij <i>s</i> . vijd., et pur l'ouverage et l'endorrer de le harnois, x <i>s</i> .,	xijs.	vijd.
Item pur l'amendement de ij cerfs d'or et le amaillere de nouvelle,	xxv <i>s</i> .	viijd.
Item en c pommes de oringe d'argent susorrez pur j daunsyng doublet fait par W. Mallynges et soun compaignon, broudereres, poisant ij <i>lb</i> . et di. <i>unc</i> . de pois de Troie, pris la <i>lb</i> . xxvijs.,	lv <i>s</i> .	ijd.
Item pur xv welkes et xv muscles pur j hancelyn blank fait par W. Venne, pois ix <i>unc</i> . de pois de Troie, iiij <i>d</i> . meyns, pris la <i>lb</i> . xxvijs. come desuys,	xx <i>s</i> .	viijd.
Et pur la facion et pur l'endorreure des pommes, welkes et muscles susditz, pris pur la pece ix <i>d</i> . et horspris un de avauntage, iiij <i>li</i> .	xvijs.	vjd.
Item en xv cokles d'argent blancs pur le dit hancelyn blank, pois iiij <i>unc</i> . et di. de pois de Troie, ijd. meins,	x <i>s</i> .	iiij <i>d</i> .
Et pur la facion de les ditz xv cokles, pris la pece, iiij <i>d</i> .,	v <i>s</i> .	
Et pur j paire de poynettes de scarlet embroudez de 'Ay', ¹	xijs.	
Et pur un altre paire de poynetz de soie noir dieux soitz embroudez oue une ourtye,	xijs.	
Item pur l'enbroudure d'une ancelyn blank oue leches tout le garnement oue ewe et rokkes,	vj <i>li</i> .	
Item pur j paire de poynettes enbroudes de hoppes et pur j bende de hoppes a le goune verd de damask,	iiij <i>li</i> .	
xxij <i>li</i> . xiijs. xjd.		

W. Mallynges, tillere.

Item pur l'enbroudure d'une dauncyng doublet de satyn blank embroudez oue arbres de pommes de oringe, pur l'or et lour overaigne,	cs.	
cs.		

Maunder Baleye.

Item in ij <i>unc</i> . di. et j quartier de frenges de soie blank et verd, pris le <i>unc</i> . xxd.,	iijs.	vijd.
Item di. <i>lb</i> . de file de Loundres,		xd.
Item di. <i>lb</i> . de file noir, blank et rouge,		xd.
Item j quartier de soie de Loundres,		iijd. ob.

¹ In the MS. this word has lines drawn round it.

Item j <i>unc.</i> de soye noire et blank,	xiiij <i>d.</i>
Item iiij laces de soie blank, noire et rouge pur doublettes,	xij <i>d.</i>
Item pur ij verges iiij quartiers et j nail de frenges de soie blank et noir et or, qe poise de soie ij <i>unc.</i> , pris le <i>unc.</i> xx <i>d.</i> et le or poise ij <i>unc.</i> et di. et j quartier, pris le <i>unc.</i> iijs. iiij <i>d.</i> ,	xijs. vjd.
xxjs. ij <i>d.</i> ob.	

Willelmus Charneye.

En iiij paires tranelles oue schakeles et tourettz et loynes,	iijs.
Et pur j chevestre double oue double reynes pur coursers,	xx <i>d.</i>
Et pur ij reynes a un altre chevestre,	viiij <i>d.</i>
Item pur iiij houces novelx pur iiij coursers Mounsieur [?],	vs.
Item pur le amendement de ij chevestres et pur j reyne delivere a Partrich,	viiij <i>d.</i>
Item pur iiij harnois oue coppers peytrels et freynes clowes oue longe barres de laton et le croupe oue vj pendantz et les joyntures et pendantz oue grantz boces de laton et grantz seynettes dedeinz, la peice xxvjs. viij <i>d.</i> ,	iiij <i>li.</i>
Item pur le amendement d'une selle pur les justes, j novel pilwe et les loynes novelx, et iiij staples et anelles,	ijs. vjd.
Item pur j paire de styropletheres pur Mounsieur,	xij <i>d.</i>
iiij <i>li.</i> xiijs. vjd.	

Penston.

In j paire de cofres enptis pro armuris domini custodiendis,	xvjs.
Item in j curtena empta de blodi card pro garneamentis domini salvo custodiendis cum cordulis ad idem emptis.	iijs. vjd.

York.

In ij camisiis de panni de reynes enptis pro domino cum factura,	xs. iiij <i>d.</i>
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George Beneyt.

Item pur ij dousein et vj paires de soilers boteux et chaussemblez, pris le dousein vijs.,	xvijs. vjd.
Item pur vj paires de baleyne pikes, pris le paire <i>xd.</i> ,	iijs. ij <i>d.</i>
ljs. vjd.	

W. Wildsshire.

Item pur le fourrure de une goune de drap d'or oue menever et pur iiij ermyns pur les maunches et coler, pris la piece xiiij <i>d.</i> , et pur l'overage de y celle xvjd.,	vjs.
Item pur j goune de russet furre oue gray et pur ij tymbres et x dos de fyn gray ad ij <i>d.</i> ob. pur les manches, pris le tymbre viijs. iiij <i>d.</i> , oue xvjd. pur l'overage,	xxs. jd.
Item pur j tymbre et di. et iiij dos, pris le tymbre vjs. viij <i>d.</i> , et pur vij dos pur l'amendement d'une coler d'une goune de blu velvet, pris la piece ij <i>d.</i> ob., oue l'overage xvjd.,	xiijs. vd. ob.
Item pur iiij ermyns, pris la piece xiiij <i>d.</i> , pur le purfiler d'une coler et manches d'une goune de rouge drap d'or fourre de menever, oue xvjd. pur l'overage,	vjs.
Item pur ij tymbres et di. et vij dos de fyn gray, pris le tymbre viijs. iiij <i>d.</i> , achatez pur le parfouyire [?] d'une goune de scarlet oue les manches, oue xvjd. pur l'overage,	xxiijs. vij <i>d.</i> ob.

Item pur j pilche noir achetes pur Mounsieur,	ijs.	
Item pur j goune de drap d'or noir furre de pure pur ij tymbres et xij ventres pur les manches, pris le tymbre vjs. viijd., et iiij ermyns pur purfilere d'un coler et maunches, pris la piece xiiijd., oue xvjd. pur l'overage,	xxjs.	iiijd.
Item pur ij tymbres de syn gray pur le purfiler d'un oiler et les manches d'une goune de drap d'or rouge, furre de cristy gray, pris le tymbre viijs. iiijd., oue xvjd. pur l'overage,	xvijs.	
Item pur le fourrure d'une goune verd de damask oue menever,		xvjd.
Item pur le fourrure d'une goune de raye, del livere le Counte de Kent, oue ventres de calabre,		xvjd.
cxiijs. ijd. [<i>sic</i>].		

Penston.

Pur j verge di. de velvet rouge pur j paire de manches, a xiijs. iiijd. la verge,	xxs.	
Item pur ij alnes de lynge toille pur lynure d'une doublet d'or [<i>sic</i>] pris l'aln xjd.,		xxijd.
Item pur ij verges de blanket et di. pur lynure d'une goune frise del liverree del senescal, a xvijd. la verge,	iijs.	vjd. ob.
Item pur iiij aln de lynge toille pur j hancelyn, pris l'aln ixjd.,	ijs.	iijd.
Item pur iiij aln de Westfall pur stoffure de meisme le hancelyn, pris l'aln vjd.,	ijs.	
Item pur vj verges de fustien pur lynure de meisme le garnement, pris la verge viijd. ob.	iijs.	iijd.
Item pur ij alnes de lynge toille pur j doublet pur daunsyng, pris l'alne viijd. ob.		xvijd.
Item pur ij alnes de lynge toille pur lynure del dit doublet, pris l'alne xjd.,		xxijd.
Item pur ij alnes de lynge toille pur j bende, pris l'alne viijd. ob.,		xvijd.
Item pur ij verges et di. de satyn blank a meisme la bende, pris la verge vjs. viijd.,	xvjs.	viijd.
Item pur j verge di. de fustien pur manches d'une doublet, pris la verge viijd. ob.,		xijd. ob. q.
Item pur ij alnes de lynge toille pur lynure de meisme le doublet, pris l'alne xjd.,		xxijd.
Item pur j remenaunt de tartaryn verd pur enbroudure d'une doublet blanc,		xijd.
Item pur j alne de lynge toille custange pur lyner del dit tartaryn,		vijd.
Item pur x doussein de poyntes, pris le doussein iijd.,	ijs.	vjd.
Item pur ij brusses achetez,		vijd.
Item pur j baselard garnise oue loketez et chape de argent susorretz, achete pur Mounsieur,	xvijs.	
Item pur ix alnes de lynge drap de reynes, dount vj verges pur lyntheaux pur la teste et v verges et j qr. in iiij coverchiefs pur Mounsieur, pris l'alne iijs. iiijd.,	xxxs.	
Item pur le facion des dits lyntheaux et coverchiefs oue blank soye,		xd.
Item pur v verges de kersy noir achetez pur chaux affaire pur Mounsieur, a ijs. la verge,	xs.	
Item pur j caas achete pro pectinibus domini,	ijs.	viijd.
Item pur j paire de scissoures pur le dit caas,		xijd.
Item pur j mirour achetes pur le dit caas,		vd.
Item pur ij doussein de poyntes,		xijd.
Item pur tartaryn noir pur l'amendement des chaux Mounsieur,		vjd.

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Item pur iiij verges de drap sanguin pur j longe goune a Mounsieur achetez, pris la verge xs. vjd.,	vij <i>li</i> . viijs. ix <i>d</i> . q. [<i>sic</i>]	xlijs.
Item in xij cordulis pro arcubus domini emptis,	.	.	.	.	.	.	vjd.
In j pari cirothecarum empto pro domino,	.	.	.	.	.	.	ij <i>d</i> .
In xij petulionibus emptis pro domino,	.	.	.	.	.	.	ij <i>s</i> .
<i>Penston.</i>							
Item in j manubrio de murret empto pro j baselard domini,	.	.	.	.	.	.	iijs. viij <i>d</i> .
Item pur j gayne pur le dit baselard achete,	.	.	.	.	.	.	xiiij <i>d</i> .
Item pur le fourber de la lunnels del dit baselard,	.	.	.	.	.	.	iiij <i>d</i> .
Item pur j peel de cheverell noir achete pur lament d'une doublet Mounsieur,	.	.	.	.	.	.	iiij <i>d</i> .
Item pur j alne de Westfall achete pur lanegler des chyvax pur les joustes,	.	.	.	.	.	.	vjd.
In v virgis de kersy nigri emptis pro caligis domini, priciu virge ijs.,	.	.	.	.	.	.	xs.
In emendacione manubrii baselardi domini,	.	.	.	.	.	.	iiij <i>d</i> .
Item in j baselard garnis cum argento empto pro domino et postea dato Edwardo Standissh,	.	.	.	.	.	.	xij <i>s</i> .
	xxxx <i>s</i> .	xj <i>d</i>.	.	.	.	.

Totalis garderobe cxxviij*li*. xiijs. ij*d*. ob. q.

XXIII.—*A Palaeolithic Industry at Northfleet, Kent.*
By REGINALD A. SMITH, *Esq., F.S.A.*

Read 4th May, 1911.

THE general recognition of man's existence in this country during the deposition of the terrace-gravels of our southern rivers may be said to date from a paper¹ read to this Society by Sir John Evans in 1859; and it was in the same year that McEnery's papers relating to his labours in Kent's Cavern were published, demonstrating the former presence of palaeolithic cave-man on this side of the Channel. The transition from river-drift to cave-deposits, on the other hand, has only recently been illustrated by a close study of the brick-earth deposit on High Lodge Hill near Mildenhall, Suffolk; and the present paper is intended to amplify the evidence for a Moustier period in England, and to bring our deposits of that horizon into still closer relation with the French. If a relative date is incidentally provided for a deposit that has long been somewhat of a mystery to geologists, and if in their turn geologists are moved to do something more for archaeology, the advantage will be considerable. The success that has recently attended what may be called 'intensive geology' in connexion with pleistocene man will no doubt find an echo in this country, and our wealth of material has certainly been used with greater advantage in the last few years. The boulder-clays, which are denied to France, should enable workers in this field to straighten out the connexion of man with the glacial period.

During the last four years there has been a continual harvest for the collector in a superficial deposit at Northfleet, nearly a mile south of the Thames near Gravesend; and without exaggeration it may be said that several thousand flints showing human handiwork have found their way from this site into various private cabinets. Those on exhibition were selected to illustrate certain points from a large number in the possession of the company working the pit, through the kind offices of their local manager, Mr. George Butchard, whose courtesy and hospitality have made the investigation of the find a most pleasant experience.

The site is south of Northfleet railway-station, about half a mile due east of Swanscombe and a mile south-east of Galley Hill, these two names being familiar to all students of the Stone Age in Britain. The pit known to some collectors

¹ *Archaeologia*, xxxviii. 280.

as Baker's Hole is called officially the Southfleet pit of the Associated Portland Cement Manufacturers (1910), Ltd., and lies south of a diminutive tributary of the Thames called the Ebbsfleet, Southfleet station being situated one and a half miles due south of that already mentioned, which is on the line between Dartford and Gravesend. The north-west angle of the pit (which is now removed) produced the remains to be described in the present paper; and at this point, which is a little east of the bench-mark 47. 74, the surface was about 45 feet above Ordnance datum. The implements occurred between 4 and 14 feet below the turf in a deposit capping the chalk, the deposit being visible at the north end of the pit, and varying considerably in thickness. The main axis of this excavation for chalk to be used in the manufacture of cement is over 1,000 yards long, and runs north and south, the slope of the surface at the north-west angle having been about 1 in 40.

At Swanscombe thousands of palaeolithic implements have been found in the terrace-gravels at the 90-foot level (the upper terrace of the Thames), and in the Swanscombe marshes west of Northfleet the formation is 40 feet of clay overlying 18 to 20 feet of gravel, which rests on the chalk. These details are mentioned in order to emphasize the distinction between the terrace-gravels of the immediate neighbourhood and the deposit which was best seen in the north-west angle of the Southfleet pit; and here I am allowed to quote the report drawn up by Mr. Clement Reid, F.R.S., who is now in charge of the lower Thames valley for the Geological Survey. As a quotation his remarks are given in smaller type, but, like Mr. Newton's description of the fauna, form an integral part of the paper. Without such assistance from specialists no speculations as to the significance of the flints would inspire confidence; and the gratuitous services so generously rendered to prehistoric archaeology by both these gentlemen, with whom the present writer has visited the sites, cannot easily be over-estimated.

A long, gently sloping spur of chalk leads upwards from near the water-level to a hill of London Clay, and on part of this slope occurs the deposit now to be described. Though a certain amount of deepening has taken place in the small valleys on either side of this spur, the contours here cannot be greatly different from those which existed when the deposit was formed. One very noticeable feature of this spur is that all superficial indications of any transverse river-terraces have here been swept away or smoothed over, their contents probably being mingled in the indiscriminate mass of *débris* which now clothes the slope.

Over part of this spur chalk is found immediately beneath the soil; but much of the area is covered by a sheet, 5 or 10 feet thick, of chalk and flint *débris* containing occasional seams of tertiary material washed from the hill above. This chalk *débris* is not stratified, but is streaky and contorted; the chalk in it is partly in lumps and grains, partly in the form of a marly paste. Throughout this mass large flints are scattered

promiscuously, and as often with their longer axes vertical as horizontal. The flints are often broken, but not water-worn, except for the eocene pebbles and some weathered flints obviously washed out of earlier pleistocene deposits. The broken surfaces of the flints are bright and black, and the edges are quite sharp, though sometimes slightly battered. Great part of the large implements which are mingled with them are in the same unweathered and unworn state, though others are patinated, evidently before they were deposited in this marly paste. The associated fossils are weathered teeth of mammoth, horse, and more rarely rhinoceros, mixed with fragments of large bones; but these teeth look like surface specimens imbedded after they had long been exposed to the weather. The species found, and their condition, are the same as in the Coombe-rock of Sussex.

It is clear that the absence of fluviatile fossils is not due to decay since the deposit was formed, for derivative eocene shells are quite well preserved, as are the derivative chalk-fossils. The deposit is not an ordinary alluvial or river deposit; it is identical in its peculiar characteristics, and probably in its mode of origin, with the Coombe-rock of Sussex.

On a sloping surface of pervious chalk no deposits are laid down under present climatic conditions; but if the climate is cold enough to allow of deep freezing of the soil, any rain falling before this soil has thoroughly thawed will flow in torrents over the surface, sweeping away the frost-shattered material from the steeper slopes and spreading it out where the slope becomes gentler. The mingled mass of slush, mud, and stones will often be so thick as to flow in a sort of mud stream; hence, I think, originates the streaky and contorted structure, and the flat flints standing upright. That the mass probably flowed only once and then stopped seems to be proved by the included chalk-fragments, for these, if exposed to a second frost and flow (after once thawing), would probably break up into a paste, and would not now be found in recognizable lumps of considerable size.

Possibly the whole deposit we now see at this spot is the result of a single exceptional thaw and flood. It may have taken place while man was still making implements on the slope just above, but it takes a long period for any distinct patina to form on a broken flint-surface, and these Northfleet implements may have lain in the soil several thousand years before they were swept down. Till we have found human bones or similar evidence it will be impossible to make sure that man and the sub-arctic conditions were here exactly contemporaneous.

The deposit, as far as I could judge during a short visit, seems to be of very late pleistocene date, and probably considerably later than any of the ordinary terrace deposits.

A brief description of the Coombe-rock may be given in the words of Dr. Mantell,¹ whose publication has not been entirely superseded:

The immense accumulation of water-worn materials on which Brighton is situated . . . is washed on the south by the sea and forms a line of cliffs 70-80 feet high, which

¹ *The Fossils of the South Downs; or Illustrations of the Geology of Sussex* (1822), 277.

exhibit a vertical section of the strata and enable us to ascertain their nature and position. The lowermost bed is—

- (1) the upper or flinty chalk ;
- (2) bed of fine sand, 3-4 feet thick ;
- (3) shingle bed, 5-8 feet thick ;
- (4) calcareous bed formed of the ruin of the chalk strata, with an intermixture of clay 50-60 feet thick ; it is provincially termed Coombe-rock.

The shingle bed consists of pebbles formed (like the present beach) of broken chalk flints rounded by attrition ; and the upper part of this bed is cemented together by calcareous spar of a light yellow or amber colour, forming a kind of breccia of a very singular appearance.

The calcareous bed is composed of broken chalk, with angular fragments of flint imbedded in a calcareous mass of a yellowish colour, constituting a very hard and coarse conglomerate. It is not stratified, but is merely a confused heap of alluvial materials. It varies considerably in its appearance and composition in different parts of its course. In the inferior portion of the mass the chalk is reduced to the state of small grains, which gradually become larger in proportion to their height in the cliff ; at length fragments of flint appear, and these increase in size and number as they approach the upper part of the bed, of which they constitute the most considerable portion. These flints are more or less broken, and resemble those of our ploughed lands that have been long exposed to the action of the atmosphere.

In some parts of the cliff irregular masses occur of an extraordinary hardness ; these have been produced by an infiltration of crystallized carbonate of lime. . . . This bed also contains water-worn blocks of Druid sandstone (greywethers) and ferruginous breccia, corresponding in every respect with those in the plastic clay formation (Woolwich and Reading beds). Small nodular masses, composed of carbonate of iron in lenticular crystals, interspersed with brown calcareous spar, have occasionally been found at the depth of 10-12 feet from the summit of the cliff. The only organic remains discovered in this deposit are the bones and teeth of the horse and of the Asiatic elephant ; these occur but seldom and are more or less water-worn.

As long ago as 1876 our late Fellow Mr. Ernest Willett impressed on the workmen in the Coombe-rock pit near Portslade station (three miles west of Brighton) the importance of preserving any fragments of bone or stones of unusual form, and he was fortunate in securing a good palaeolithic implement of St. Acheul appearance, 5.3 in. by 2.6 in., which he wisely and generously presented to the Brighton Museum. The edges are slightly rolled, and the implement no doubt travelled some distance with the deposit, in which it was found at a depth of 15 feet from the present surface. It is stated that such specimens are extremely rare,¹ and Mr. Toms, who is in charge of the antiquities at Brighton, knows of no other from this deposit in the neighbourhood of Brighton,

¹ Fred. Dixon, *Geology of Sussex*, 2nd ed., 112.

though many are found on the surface of the Downs on or near patches of clay-with-flints.

Mr. Clement Reid has made a special study of the Coombe-rock for the Geological Survey, and propounded the following theory in 1887¹:

After the formation of the ancient sea-cliff at Brighton an enormous mass of angular flints and chalk detritus was swept from the Downs, and spread far and wide in a continuous sheet over the lowlands. In the coombes, and for three or four miles south of the Downs, it consists of a mass of unstratified or obscurely stratified flints, battered but not rolled, and imbedded in a matrix of chalk paste and pieces of chalk. Close to the old cliff, as at Brighton, large masses of chalk are found in it and also locally enormous greywethers. Fossils of the Coombe-rock consist almost entirely of teeth of horse and elephant, broken and apparently also decayed before they were imbedded. The enormous sheet of Coombe-rock has evidently been derived from the Downs. The Head at Bovey Tracey, a deposit very like Coombe-rock, is associated with the Arctic birch, bearberry, and some northern willows. The mean temperature in the south of England was very considerably below freezing-point, consequently all rocks not protected by snow would be permanently frozen to such a depth as to modify entirely the drainage-system of the country. Any rain falling in the summer would be unable to penetrate more than a few inches, and would run off the steep slopes of the Downs and form violent and transitory mountain-torrents, tearing up a layer of rubble previously loosened by the frost. This was the origin of the steep-sided coombes and of the Coombe-rock. It was probably a period of drought, perhaps equivalent to the Loess period in central Europe.

The position of the Coombe-rock at Brighton above a raised beach in itself furnishes a relative date that may some day be more accurately determined, and it is not too much to expect that some relation between the raised beaches and the river-terraces will presently be established for this country. In any case it is clear that the cold was intense, at least in winter, at the time the Coombe-rock was laid down, and that the land was lower in relation to the sea than at the present day, a circumstance that would tend to raise the temperature. It must be confessed that the implements and bones were mainly excavated by the workmen, but enough is preserved to indicate with some precision the horizon of this deposit. The following report by Mr. E. T. Newton, F.R.S., deals with the animal remains in the possession of the Company:

The mammalian bones obtained by Mr. Geo. Butchard from 'Baker's Hole' at Northfleet, associated with peculiar flint implements, have been submitted to me for identification. They number about 150; but unfortunately the greater number are too fragmentary to give a clue to their generic affinities. It has been possible, however, to identify some sixty of them with more or less certainty, and these are referable to

¹ *Quart. Journ. Geol. Soc.*, xliii. 364.

four distinct forms, namely *Elephas primigenius*, *Rhinoceros leptorhinus*, *Equus caballus*, and *Cervus elaphus*.

Elephas primigenius (Mammoth) is represented by portions of two large grinders and a fragment of another. One of these is a very characteristic tooth, and leaves no room for doubt as to its having belonged to *E. primigenius*. Portions of limb-bones, feet, vertebrae, &c., to the number of twenty-four, also belong to Elephant and in all probability to *E. primigenius*, but their specific identification is uncertain.

Rhinoceros leptorhinus. Half a dozen parts of large limb-bones undoubtedly belong to *Rhinoceros*, and a portion of a lower grinder must be referred to *Rhinoceros leptorhinus*. The tooth thus supplies satisfactory evidence for the presence of the species; and there is little doubt but that the limb-bones belong to the same form.

Equus caballus (Horse). Eight lower grinders, a metatarsal bone, and a radius evidently belonged to a large form of horse. And a fragment of a small metapodial bone clearly represents a very much smaller animal.

Cervus elaphus (Red-deer). The basal portions of two large antlers and a dozen pieces of tines belong undoubtedly to the Red-deer.

The small number of species represented by this series of osseous remains prevents any very definite conclusions being drawn as to the precise horizon of the deposit in which they were found; but the presence of *Elephas primigenius* and *Rhinoceros leptorhinus* would seem to indicate a similar age to that of the brick-earths of Ilford and Grays.

The above list contains nothing inconsistent with the fauna during the period of Le Moustier, except perhaps one item. The fragmentary tooth identified as belonging to leptorhine rhinoceros had evidently met with rough usage before being buried on this site, and it is a characteristic of the Coombe-rock fauna that teeth and large bones alone remain, showing signs of exposure and rough treatment. The species of rhinoceros that is uniformly found in association with the mammoth is the tichorhine,¹ with a woolly covering against the cold; while the earlier leptorhine belonged to a warmer climate, and is generally associated with the straight-tusked elephant (*antiquus*) and the hippopotamus. It is conceivable that this solitary tooth was already an antiquity when it was swept up into the Coombe-rock. Possibly it belonged to the upper terrace-gravel, and should rank with the derived palaeoliths; but in any case it is not sufficient evidence that the leptorhine rhinoceros was here contemporary with the mammoth, of which plentiful remains have been found in the Coombe-rock.

What may be termed the natural history of the site has now been disposed of, and it remains to notice the works of man so abundant in this quaternary deposit. Any type-series selected from the finds must convey but an imperfect idea of this human industry, and an examination of the bulk is necessary to bring

¹ Teeth of this species were found by Mantell in the Coombe-rock at Brighton (*Quart. Journ. Geol. Soc.*, vii. 366).



DERIVED PALAEOLITHIC IMPLEMENTS, NORTHFLEET PIT
Nearly $\frac{2}{3}$ linear

out the true significance of the discovery. The whole may be divided into two very unequal classes, the distinction between them being so obvious that no minute details need be given at this stage of the inquiry. At least 99 per cent. exhibit a strong family likeness, and must be taken as typical of the site. This group consists of flakes and cores, unrolled and in most cases unpatinated, indicating an extensive factory on the spot of implements of Le Moustier type, of unusual size, and flaked mainly on one face.

The exceptional specimens, about 1 per cent. of the total, are implements of greater antiquity derived from the upper terrace-gravels, worked on both faces, mostly rolled and patinated, evidently the sweepings of the neighbouring surface, and carried down over a workshop-floor along with other constituents of the Coombe-rock. This group contains recognized types of the Chelles and St. Acheul periods, nearly all of different varieties of flint, and showing a wide range of patination and surface condition. It is fair, therefore, to assume that they have had different histories, and their forms are sufficient evidence of their relative dates. They should belong to the older terrace-gravel of the Thames; and if the Coombe-rock theory is correct it is clear that they were washed out of the 90-foot terrace which exists above Baker's Hole by the deluge of mud that now forms the 'uncallow' (unutilized material) of the pit.

On the accompanying plate LXXII a few specimens are reproduced to point the contrast they present to each other and collectively to the débris of the workshop on this site.

- No. 1. Small lanceolate implement of brown flint with creamy patina, with crust on sides of butt, unrolled: Chelles type.
- No. 2. Lustrous implement of black and brown flint, rolled edges, with rough indigo markings: Chelles type.
- No. 3. Subtriangular implement of black flint, with much creamy patina and thick crusted butt, unrolled: St. Acheul I type.
- No. 4. Fine subtriangular implement with edges twisted and running all round except for a flat space beside the butt, grey patina, unrolled: St. Acheul II type.
- No. 5. Ovate implement of black and brown flint with edge all round, unrolled: St. Acheul type.
- No. 6. Amygdaloid implement of black flint with white markings except on the knots, thick crusted butt, unrolled: St. Acheul I type.
- No. 7. Ovate implement (French, *limande*) of pale brown flint with some dendritic marking, a flat space on edge beside the butt, unrolled: St. Acheul I type.
- No. 8. Implement of black flint with dendritic markings on bluish-white face, the other pure white, cutting edge along one side and small patch of crust on opposite thick edge, unrolled: St. Acheul type.

It would have been strange if such a vast aggregation of worked flints as that in Baker's Hole had remained unnoticed till the last four years, and in fact the deposit, or a neighbouring deposit of the same character, was not only broached but described in detail nearly thirty years ago. In 1883 Mr. F. C. J. Spurrell read a paper¹ on 'Palaeolithic Knapping-tools and modes of using them, with special reference to Crayford and Northfleet'. At the latter place he discovered and examined cartloads of flakes lying on a river beach, perhaps dry in summer

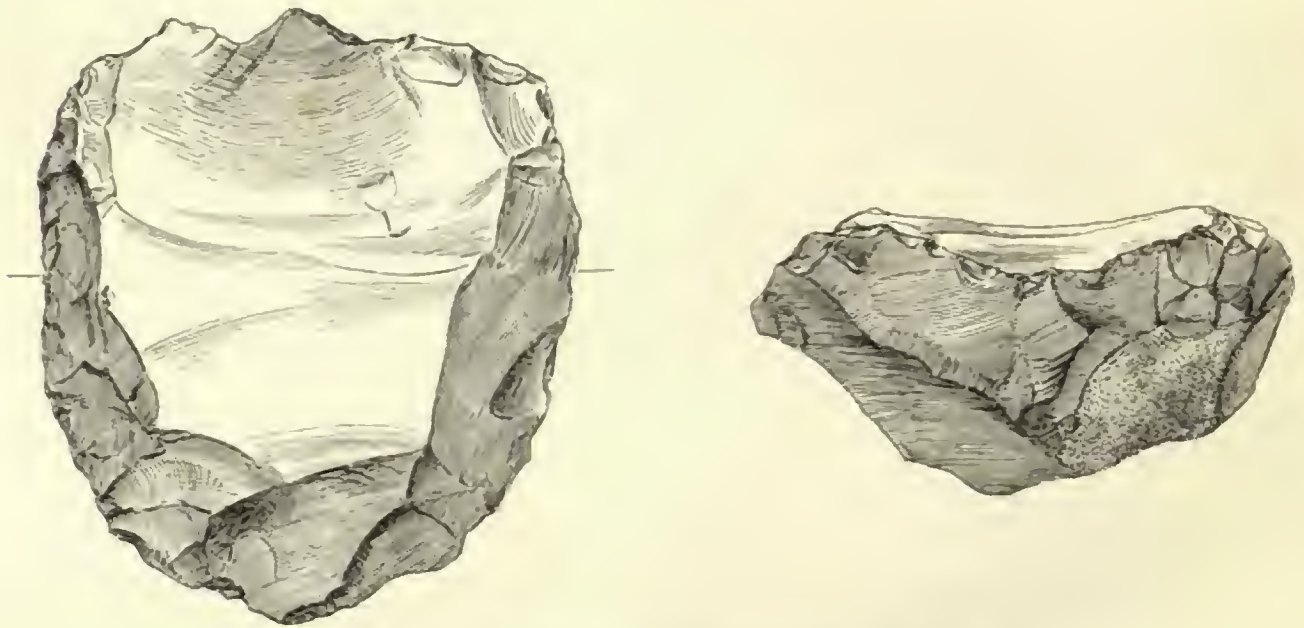


Fig. 1. Tortoise-shaped core, Northfleet: top and end views. $\frac{1}{2}$.

and liable to floods. After the deposit of this refuse from a flint factory some of the ground had been disturbed by ice, but it was clear that the mass was practically *in situ*, and that palaeolithic man lived in the immediate neighbourhood. Among the flints were some that indicated a special mode of manufacture, and Mr. Spurrell's description shows that he had come across specimens like those exhibited on the present occasion.

This mode of manufacture largely depended on sharp-pointed hammers. A flint stone being selected and trimmed coarsely round the sides, the upper face was worked into the form of a flat dome; then from one end the whole of this prepared surface was detached

¹ *Journal of Anthropological Institute*, xiii. 109, pl. iii, fig. 5 (side view of core, 5 in. wide), and figs. 7, 8 (views of perfect implement, 4 in. long). A summary in *Archaeologia Cantiana*, xv. 102. The term 'turtle-back' is used for a certain class of implements in America; W. K. Moorehead, *The Stone Age in North America*, i. 40, 191, 348.

by a single blow, producing, when the operation had been well conducted, a 'turtle-backed' flake, with a flat surface on the other side. It is remarkable how much preparation and labour depended for its ultimate success on adroitness in the delivery of a single blow. The trimming of these 'turtle-backed scrapers' is invariably on the raised face only. They might equally be skinning implements or sleeks (slicks) for dressing skins, and were admirably adapted for the first purpose. . . . Held with their rounded (or bevelled) sides towards the skin, they could only cut downwards, and if they slipped could not perforate or injure it, a matter of extreme importance in those times.

Mr. Spurrell has presented to the Natural History Museum a large oval flake with enormous bulb of percussion, found in the tramway-cutting at Ebbsfleet (adjoining Northfleet), and no doubt belonging to the series under dis-



Fig. 2. Flake thickened at the point, Northfleet. $\frac{1}{2}$.

cussion, if the tramway meant is that leading over the stream known as the Ebbsfleet past the Roman villa to the large pit sometimes called Baker's Hole.

Tortoise-shaped cores. This is perhaps the most striking group in the enormous series from Northfleet, and the uniformity of working is sufficient proof that they belong to one industry. Typical specimens measure 6 in. by $5\frac{1}{2}$ in. and 7 in. by 6 in., the greatest thickness being about the middle, and ranging between $2\frac{1}{2}$ in. and 3 in. The two faces are easily distinguishable (fig. 1). One that must be regarded as the lower when in use is more or less

conical, the shape being produced by removing flakes which, starting from the oval edge, approach (but do not generally reach) the apex of the cone, where a patch of crust is frequently allowed to remain. The cone apparently served no useful purpose, and may have been merely the result of trimming the edge into an oval form by alternate flaking. The upper face, on which more care was bestowed, was rendered convex by surface chipping, sometimes longitudinal, most of the blows being delivered, however, at the edge, and resulting sometimes in serviceable flakes. The intention of the flint-worker was evidently to dress the whole upper surface before striking off the flake, the under or bulbar face of the detached flake being quite flat when the final blow that severed it from the core had been successfully delivered. Extant specimens show clearly that this was not always the case; instead of running horizontally the fracture sometimes passed upwards or downwards, the flake then breaking off short (pl. LXXIV, fig. 4), or suddenly becoming thicker at the end away from the bulb by encroaching on the core (fig. 2). The striking surface at the butt-end was prepared generally with a somewhat steeper edge-flaking, which gave rise to a number of facets. On one of these the liberating blow fell, producing a large bulb of percussion on the detached flake,¹ and leaving a corresponding cavity on the upper face of the block. Several examples show that when this one flake was removed, whether successfully or not, the core was laid aside and not further utilized. This fact indicates an enormous stock of raw material, and a strong demand for a particular pattern of tool, flaked on one face only in the style of Le Moustier.

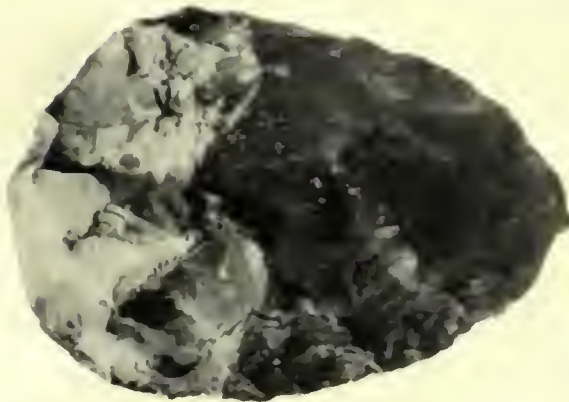
Other trimmed cores. There are also a few oval cores, about 6 by 4 in., and equally convex on the faces, which have not had the flake-implement detached, though this might have been done on either face. The flaking is somewhat rough, one face rather better than the other at times, and it is probable that these nuclei were finally rejected by the flint-worker as not being up to the standard of size or finish. Though about the size and shape of a *limande* (the St. Acheul type named by the French after the dab-fish), these exceptional specimens do not seem to have been intended for implements in this condition, nor to have been used as such, the edges being blunt and conspicuously sinuous all round.

The perfect implement. As might be expected, the number of successes (as pl. LXXIV, fig. 1) is limited, and would not often have remained on the working-floor along with the refuse; but the few preserved from this site not only show

¹ Our Fellow Mr. Garraway Rice exhibited in illustration of this feature several flakes found in front of the Union Workhouse at Ospringe, on the west side of Faversham and about twenty-five miles from Northfleet. They may be contemporary, but the circumstances of the discovery are not known.



1 a



2 a



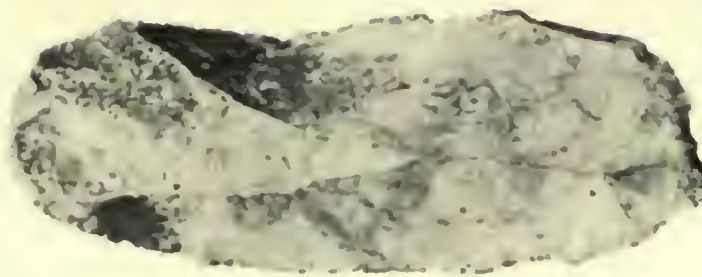
1 b



2 b



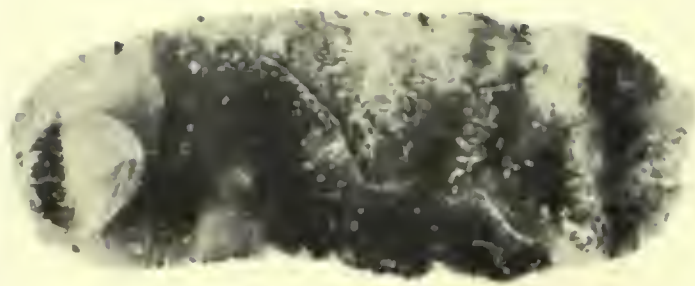
3 a



4 a



3 b



4 b

NORTHFLEET AND LE MOUSTIER IMPLEMENTS COMPARED

Nearly $\frac{1}{2}$ linear

Figs. 1, 3. Le Moustier, Dordogne.

Figs. 2, 4. Northfleet, Kent.

what the craftsman was aiming at, but also prove that he was closely connected, in culture if not also in blood, with men who at one time occupied the cavern of Le Moustier in the Dordogne. The analogy is strikingly illustrated on pl. LXXIII, where views of a perfect implement from the classical site are given side by side with one of the best specimens from the Northfleet series. Specimens comparable with that chosen for illustration measure $5\frac{1}{2}$ by $3\frac{1}{4}$ in., 5 by 4 in., $5\frac{3}{4}$ by 4 in., $4\frac{1}{4}$ by $3\frac{1}{4}$ in., and 7 by $4\frac{1}{2}$ in.

The large oval implement from Le Moustier cavern (pl. LXXIII, fig. 1 *a, b*) is not the most common type of that period, and may belong to its earliest stage, but cannot be relegated to the preceding (Drift) period of St. Acheul without upsetting the recognized classification, as the implement is flaked on one face only and is not the only example extant. It is, however, of brownish flint, whereas specimens from Le Moustier are generally of dark grey without any alteration of the surface. The bulb alone was trimmed on the flat face (pl. LXXIII, top of fig. 1 *b*), and there are signs of use as a scraper (*racloir*) on the two edges. The upper or convex face has evidently been flaked from the edge before separation from the core, and been subsequently trimmed or flaked by use round the edge. This may be regarded as a successful implement, well formed and used after it left the workshop. It measures 7 in. by 4 in., the photograph being about half-scale.

The Northfleet parallel is typical of the site in some respects and exceptional in others. It happens to be of brown flint, not quite the same quality as that from Le Moustier, and altogether distinct from the bulk of the Northfleet series; but it is a good example of the type that the local flint-worker was trying to produce, at least with respect to its outline and upper or convex face (pl. LXXIII, fig. 2 *a*). The flat face (fig. 2 *b*) is on the other hand abnormal, for it is not a clean fracture, but flaked all over, with part of the pale crust remaining near the butt. This extensive trimming no doubt remedied a defect in the original fracture, for which the quality of the flint was perhaps responsible, but in this respect it cannot be regarded as typical of the factory.

Large flakes of other forms. The skill and good fortune of the flint-worker on this site may be estimated to some extent by the larger flakes evidently struck from tortoise-shaped cores. They may be classified as long, oval, and circular flakes, of which comparatively few show any signs of use, and it is possible that they were abandoned as failures, good implements not being left on the workshop floor. The long flake is generally 5 or 6 in. by 4 in. (pl. LXXIV, figs. 6, 7, 8), and the circular (pl. LXXIV, fig. 4) about 5 in. in diameter, the oval (pl. LXXIV, figs. 1, 2, 5) occupying an intermediate position. Practically all are unused, and may be regarded as unsuccessful attempts at the typical implement, thrown aside by the flint-worker. On pl. LXXIII are shown side by side long flakes from

Northfleet and Le Moustier itself. The latter specimen (pl. LXXIII, fig. 3 *a, b*) is of the usual brownish-grey flint, practically unused, the bulb having been knocked away after the flake was detached from the core. The same may be noticed on the Northfleet specimen (pl. LXXIII, fig. 4 *b*), which shows some dendritic marking, but is quite representative of hundreds of others from the site.

The true palaeolithic disc, like those from Santon Downham in Suffolk and Abbeville in France, is not represented here, and indeed belongs to the earlier period of St. Acheul. The flakes occasionally show slight edge-chipping on one



Fig. 3. Side chopper, Northfleet; with section. $\frac{1}{2}$

or both faces, due in the latter case perhaps to use as a saw, but in neither to true secondary chipping, that is, trimming subsequent to removal from the core in order to get a symmetrical outline or smooth face. Careful finishing of this kind does occur on some of the successful flakes, particularly on a black specimen (pl. LXXIV, fig. 3), but this is easily distinguishable from the group under discussion.

Chopping tools. Exceptional at Northfleet, but plentiful in the cavern of Le Moustier are heavy tools (fig. 3), with convex cutting-edge along one side, the opposite edge left intact with the crust on it, or flaked and battered so as to present no sharp edges to the hand. These were evidently held by the back, and used for chopping, similar tools being found occasionally in the Drift.¹

A flint may be 'worked' either into or out of shape, and there is generally an ambiguity in the phrase; but 'trimming' may be used for deliberate chipping into shape, and 'use' for accidental flaking caused by sawing, scraping, planing,

¹ Worthington G. Smith, *Man, the Primeval Savage*, p. 122; *Stone Age Guide* (British Museum), 2nd ed., p. 27.

cutting, &c., with the ready-made tool. A small proportion from Northfleet show something more than signs of use on the bulbar face, and surface-flaking was evidently resorted to in order to minimize an excessive bulb of percussion or to rectify inequalities at the other end of the flake. Such exceptional trimming is seen on a few smaller (and presumably later) palaeolithic flints from this country, as Kent's Cavern, Devon; Creswell Crags, Derbyshire; and Ffynnon Beuno Cave, St. Asaph,¹ these perhaps heralding the lozenge blades of the Solutré period, which are flaked all over both faces.

The original flint, which was evidently mined in the immediate vicinity, though the source cannot now be identified with certainty, was black and slightly translucent, but most pieces have changed to grey. This transformation does not in all cases imply a long period of exposure on the surface, for the inferior flint now mined at Brandon for the manufacture of gun-flints weathers to a dull grey in a few hours, acquiring a false patina.² The other changes illustrated in the Northfleet series, from grey through a series of gradations to buff, must have been produced over a very long period, but, to judge from analogy, before the burial of the flints in this deposit, for exposure to the weather seems to be a necessary factor in natural patination. The whole question is still under discussion, but the series seems fairly complete at Northfleet, and the conclusions arrived at are confirmed by specimens of double patination. From grey the change is to bluish-white, often mottled, the bluish tinge being due to the original black body of the flint showing through a white film on the surface. Further exposure seems to have thickened this film, eliminating the blue (sometimes on one face only) and producing a uniform white, which in its turn becomes creamy, and eventually, but only in a few cases, a pale buff colour by slight staining. The yellowish brown seen on a specimen here and there was no doubt due to iron-staining of a creamy or buff surface. The decay of iron pyrites in the chalky matrix would be a sufficient explanation of this coloration.

The black flint used on this working-floor often had grey 'knots', which seem to be denser than the surrounding flint, and less susceptible to patinating influences; but there is enough uniformity in the material to enable us to distinguish this quality from that procured from Swanscombe, and exploited largely in the earlier palaeolithic period. Hundreds of implements from the terrace-gravels here are marbled brown, yellow, and black, but brown all through, whereas the Northfleet material is black within.

A parallel for many points in the above description of the Northfleet industry may be found in Prof. Commont's account of discoveries in the North of

¹ *Quart. Journ. Geol. Soc.*, xlii. 9, fig. 6 (Natural History Museum).

² According to Dr. Allen Sturge, who also informs me that the supply of first-class flint at Brandon is now exhausted.

France.¹ Besides the classical sites of St. Acheul, Montières, and Abbeville, no less than twenty-three 'stations' north and south of the Somme have yielded relics of the Moustier period, and enabled the Professor to distinguish even flakes of this horizon from others of earlier or later date. Most of the above French sites rarely produce the so-called Moustier point (as recently found in Jersey, see above, p. 457); but the Levallois flake (named after the Levallois-Perret quarter of Paris, where the type is well represented) is abundantly found, and offers a striking resemblance to the Northfleet series. It was the dominant type at this stage of the palaeolithic period (that is, the beginning of late pleistocene times), and by no means confined to the Dordogne, where the cave of Le Moustier is situated. It has frequently been found both on the plateau and in the valley, but has been overlooked by the collector in the past. Both on the earlier working-floor at St. Acheul and on sites of the Moustier period Prof. Commont has found large flakes that fitted into their original cores, and the method of flaking in either case can thus be described in detail.

In the St. Acheul period the flint core was flaked with no particular system, the resulting flakes being short, thick, and irregular. After the crust was removed, the blow was delivered on an almost flat surface, produced by the previous removal of a flake. The striking-point is seen as a semicircular projection at the base of the detached flake, and the bulb of percussion is small, only spreading over a small portion of the under-face of the flake. The craftsmen of the Moustier period had another method, and their large flakes, instead of being square at the base, are polygonal. The bulb is enormous, of extreme convexity and area, covering an appreciable portion of the under face of the flake. Whereas in the earlier period the blow was oblique on an extensive 'platform' or striking-plane and, meeting with greater resistance on the part of the flint, produced a small bulb, the later craftsman aimed a blow at right angles to one of the facets at the end of the core. In this case the platform was extremely small and the lateral resistance to the blow in flaking was therefore negligible, hence the thickness and great extent of the bulb of percussion. The facets of the core constitute another distinctive feature of such flakes as those from Northfleet, and the process is fairly obvious from the specimens exhibited. The workman first removed the projections from a large block of the raw material, no doubt fresh from a neighbouring bed, and then trimmed the core into a polygonal form. By blows right and left of a line more or less straight all round the block, one face was rendered convex and the other often conical. It was from the upper or flatter face that a large flake already trimmed was to be detached, while the

¹ *L'industrie Moustérienne dans la région du Nord de la France* (5^{me} Congrès préhistorique de France, Session de Beauvais (1909), 115).



TYPICAL FLINTS FROM THE WORKSHOP NORTHFLEET PIT
 Nearly $\frac{1}{2}$ linear

pointed base seems to have been the unintentional result of the trimming process and served no useful purpose, while it has perplexed many collectors in recent years.

The method of dressing the upper face before detaching the flake from its core is not confined to the Moustier period, but was common in the neolithic workshops of Le Grand-Pressigny (Indre-et-Loire), as hundreds of *livres de beurre* (elongated cores the colour of old beeswax) remain to testify. Except that the Pressigny flint was chiefly used in the manufacture of long blades instead of oval flakes, the two industries are practically identical, both faces being trimmed from the periphery, but only the flatter being utilized.

In Prof. Commont's experience the implement has often been spoilt and the core rendered useless by faults in the flint. A 'knot' or particularly hard spot in the stone has diverted the fracture towards one or the other face, and either produced a stumpy flake (as pl. LXXIV, fig. 4) or a long one with a large lump attached to the bulbar face near the point (as fig. 2). He also notes many instances of cores that show where a flake has been detached more or less successfully; and has collected a certain number of cores from which elongated flakes have been struck, an evident anticipation of the blades that characterize the last division of the Cave period (La Madeleine).

This method of overcoming the resistance of the flint may have been discovered accidentally, but once learnt was not forgotten; and, though the Moustier industry is generally regarded as a falling-off from the high standard of St. Acheul, it seems that Le Moustier man succeeded in getting all the advantages of the earlier tool with much less trouble than his predecessor, and gave up the more laborious process of flaking both faces. The change was gradual, and hence the frequent appearance of the hand-axe (*coup de poing*) in early Moustier deposits. The smaller flakes, worn by use into the so-called 'Moustier point', were often derived from the sides of the core and resembled the simple flake of all periods, in form if not in patina; whereas the larger Levallois flakes were formed in the peculiar manner already described, and sometimes measured six or seven inches long and one to two inches in thickness at the butt. These belong to the lower Moustier levels of the typical site of Montières, and to the base of the *ergeron* (upper loess) at St. Acheul itself, associated with hand-axes.

The large flake, when detached from the core, was trimmed by secondary chipping along one or both of the long sides, and became a side-scraper or double-scraper accordingly. Other forms of smaller flakes are saws (chipped by usage along the edge on both faces), knives, end-scrapers or planes, graving-tools, lance-heads, hollow-scrapers, and blades, but the succession of these minor and rarer types has still to be decided. The accompanying fauna is not well

preserved, as the beds are largely decalcified; but the mammoth, woolly rhinoceros, bison, horse, reindeer, hyaena, wolf, fox, pouched marmot, polecat, weasel, water-vole, and marmot have been determined, some at least of the species indicating a climate like that of Siberia at the present day.

The above is a somewhat long summary of a paper that does much to determine the distribution and evolution of Moustier types in the north of France, just as Prof. Commont's researches at St. Acheul have cleared up many problems connected with the earlier stages of the palaeolithic period. At the risk of repetition, his results have been given in some detail just to show the entire agreement between Le Moustier deposits on either side of the Channel, if such a phrase is permissible with reference to a time when the Straits of Dover did not exist. In Belgium the period seems to have left no traces, and the reason assigned by Dr. Rutot is that the country was then under water, which laid down loess (*loess fluvial*, or *limon Hesbayen*), due to the melting ice of the second quaternary or Riss glaciation. His view that the population was driven south out of Belgium, South England, and the Paris basin by this deposit may, however, be modified in view of the English deposits at High Lodge (Mildenhall) and Northfleet, besides the extensive series in the neighbourhood of the Somme, recently published by Prof. Commont.

There are indeed one or two fine implements in the present series (as pl. LXXII, fig. 4) of the type St. Acheul II; but in spite of the fact that we are dealing mainly with the debris of a working-floor, these implements are a negligible quantity in view of the vast numbers of flints manufactured in another style. Implements worked on both faces, of the typical Northfleet flint and without wear or patina, seem to be only casual survivals from an earlier industry or civilization. This admixture of earlier forms occurs on other sites; but if the term St. Acheul II is not to be abused, Prof. Commont's classification must be accepted. On the other side, Dr. Obermaier would so far agree with Dr. Rutot that Levallois flakes belong to the end of the Drift rather than to the beginning of the Cave period; and states that they first appear towards the end of the period St. Acheul I, culminating in the second stage of that period. The type, he continues, is represented on all St. Acheul sites in company with fine hand-axes of lance-head form as well as numerous typical Moustier forms. The Levallois flake is a long and broad blade of regular outline and thin section. One face is flat, frequently with the bulb of percussion. Pointed and oval forms occur and are normally trimmed for use in chopping, cutting, scraping, planing, and boring. The split hand-axe (*Halbfaustkeil*), considered by de Mortillet and others as a transition from the hand-axe to the Levallois flake, is rare, as for instance at St. Acheul; and the Levallois type is more likely a descendant of the large flakes that appeared in the early Chelles

period and developed independently of the hand-axe. He agrees, however, with Prof. Commont that this type rendered the hand-axe of St. Acheul II superfluous, and eventually superseded it; the Levallois flake was more easily produced, and yet served all the purposes of the developed hand-axe.¹

There is also independent geological evidence in this country for the succession adopted in this paper. For the last ten years implements of St. Acheul types have been found in large quantities at Knowle Farm Quarry, Savernake Forest;² and the gravel there (not a true terrace-gravel, but 450 feet above the sea) has been equated with the well-known deposits of Southampton Water, Bournemouth, and the Avon Valley. All these are more ancient than such deposits as the Coombe-rock of Brighton or the lowest terrace-gravels in the valleys of southern England.³ Mr. Pocock states that on top of the chalk at Grays (on the north bank of the lower Thames) there is a bed of flints and chalk fragments a few feet thick which shows signs of disturbance by pressure. Mr. H. B. Woodward, who examined the deposit, thought that, while it bears some resemblance to the Coombe-rock of Sussex, which Mr. Clement Reid regards as indicating a recurrence of arctic conditions after an interglacial episode, yet the bed might possibly be due to glaciation of the surface at the time when the chalky boulder-clay was formed. Its age is uncertain, but its position suggests that it is later than the denudation of the high terrace-gravel. It is not improbably contemporaneous with the low terrace-gravel and with the Coombe-rock.⁴

In conclusion, it may be pointed out that there is a similar deposit on the other side of the Channel, at Sangatte near Calais, which has yielded flint implements of Le Moustier types.⁵ Years ago Sir Joseph Prestwich remarked that in general structure, colour, materials, and order of superposition the cliffs at Sangatte and Brighton so closely resemble one another that a section of the one might almost pass for that of the other.⁶ Whether the Straits of Dover then existed or not, the conditions seem to have been uniform in the neighbourhood, at least at Northfleet, Brighton, and Sangatte, and there is ample justification, therefore, for an attempt to correlate the English and French deposits. Blades measuring 5 in. by 2 to 3½ in., without patina or lustre and with sharp edges, have been found in quantity at Compiègne, Oise,⁷ nearly all 'rechipped at

¹ Obermaier, *Die Steingeräte des französischen Altpaläolithikums* (Vienna, 1908), 74, figs. 117, 118, 122, 123 (separate impression, from *Mitt. der prähist. Kommission der Kais. Akad. der Wissenschaften*, vol. ii).

² *Proceedings*, xxii. 453.

³ *Summary of Progress in 1902* (Geological Survey), 208.

⁴ *Summary of Progress in 1902* (Geological Survey), 206.

⁵ De Mortillet, *Le Préhistorique*, 3rd ed. (1900), 599.

⁶ *Quart. Journ. Geol. Soc.*, vii. 274; section of Brighton cliff, fig. 7, p. 365.

⁷ *L'Homme préhistorique*, 1904. 118.

the butt' (apparently faceted before being detached). An important workshop of Le Moustier date, occupying several hectares, was also excavated at Busigny (Nord), and with an abundance of typical tools and flakes occurred a few small and fine hand-axes (*coups de poing*),¹ in close agreement with the Northfleet find. Here the flakes are sometimes patinated, no doubt through long exposure on the surface,² but their condition shows they were practically unmoved from the place where they were made. This fact, and the absence of any types indicating a later stage of the Cave period, render it most probable that the Northfleet site was overwhelmed by the Coombe-rock before the apogee of the Moustier period; and the presence of well-patinated implements³ of the same type as the unpatinated majority is some indication of the enormous length of this single phase of the Quaternary period.

¹ *Le Préhistorique*, 599. Hand-axes of St. Acheul type have even occurred at Le Moustier (*L'Homme préhistorique*, 1904, 198, fig. 92, nos. 1, 2).

² Some have evidently lain on one face more than the other, the deeper patination of the upper face just encroaching on the edge of the under face, where it was unprotected by contact with the ground.

³ That flints in the Coombe-rock had been long exposed to the atmosphere is noticed in *Quart. Journ. Geol. Soc.*, vii. 126; other formations, apparently contemporary, are also given in a table opposite p. 136.

XXIV.—*The Discovery of the Remains of King Henry VI in St. George's Chapel, Windsor Castle.* By W. H. ST. JOHN HOPE, Esq., M.A.

Read 11 May, 1911.

IN the year 1790 the Bishop of Carlisle, Dr. John Douglas, who was also Dean of Windsor, communicated to the Society of Antiquaries an account of 'the Vault, Body, and Monument, of Edward IV. in St. George's Chapel at Windsor'. This forms one of the memoirs printed in the third volume of *Vetusta Monumenta*, and describes certain discoveries made on 13th March, 1789, 'in making the ground to receive the new pavement' in the north aisle of the quire.

Towards the end of the Bishop's paper, which does not itself otherwise concern us now, reference is made to another vault near that of King Edward IV, in which it is supposed his daughter Margaret and his third son George Duke of Bedford lie.

'This vault,' the Bishop states, 'escaped the examination of the paviours, as did also that of Henry VI. When, in the progress of their work, they had reached the arch in the south aisle, under which King Henry was buried, in digging ground for the new pavement, they found the entrance into the vault, but were directed not to open it.'

Further on the Bishop's account adds: 'The south door of the choir opening within the compass of the arch, under which Henry VI. lies interred, no memorial of him could be fixed up directly over his vault; but by his Majesty's order a marble grave-stone has been laid down upon the pavement in the adjoining part of the south aisle, with his name inscribed, HENRY VI. and the royal arms.'

The second bay of the south aisle of the quire, which is the part of the chapel here referred to, has always been associated by tradition with the name of King Henry VI; and the whole of it was formerly decorated in his honour with colour and gilding, traces of which may still be seen; while the key of the vault, which dates from the reign of King Henry VII, bears a sculptured representation of the King's arms and supporters.

The arch forming the north side of the bay is now filled with a wooden screen and pair of gates, but before the quire stalls were extended eastward in 1788 the gates were in the third bay, and the King's arch contained a screen only.

534 DISCOVERY OF REMAINS OF KING HENRY VI

In a plan of St. George's Chapel published by Hollar in 1674 the site of King Henry's grave is indicated by an enclosure of some kind within the second arch, between the quire and the aisle, entitled 'Sepulchrum Regis Henr: 6'; a much later plan, made in 1805 by Mr. Emlyn, who was in charge of the repaving works of 1789, and published by Nash, also refers to the same place, but as 'Henry the VI. Vault'.

The repaving has obliterated any traces of the King's tomb and altar mentioned in the will of King Henry VIII, and the marble slab laid down to the

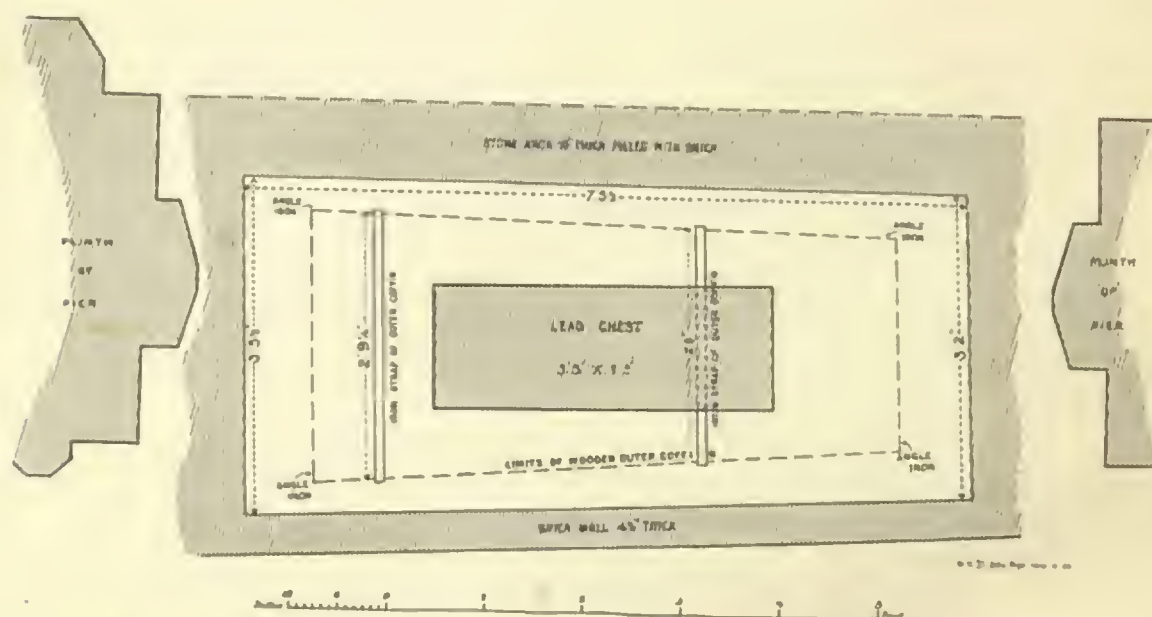


Diagram showing relative position of lead chest and wooden coffin in King Henry VI's grave.

King's memory avowedly does not cover any supposed grave, and as a matter of fact there is no vault under it.

The reference to King Henry's vault in the Bishop of Carlisle's memoir tells us so little that it has always been a matter for speculation what was actually seen in 1789.

A tentative examination made in January, 1910, by Canon Dalton and myself disclosed the existence of a brick grave or vault which contained a small lead chest, under the arch to which tradition has all along pointed, and we also ascertained that no grave had at any time been made under the first arch, immediately south of the altar, opposite the tomb of King Edward IV, probably on account of the sedilia being there.

These discoveries made it all the more imperative that a complete examination should be undertaken, and His Majesty the King having been pleased to signify his approval, a formal investigation was made on Friday, the 4th of November, 1910. There were present the Dean (Dr. Eliot), and Canons the Hon. Leonard Tyrwhitt, Dr. Sheppard, and Mr. Dalton, as representing the Chapter, the Provost of King's (Dr. M. R. James) and the Provost of Eton (Dr. Warre), as the heads of the two great foundations of King Henry VI, Dr. A. Macalister (Professor of Anatomy in the University of Cambridge), and the writer, together with Mr. Harold Brakspear (architect), Mr. A. Y. Nutt (surveyor), and Mr. A. W. Evans (verger).

As a preliminary work the marble step across the second arch had been taken up, and a bed of dry and loose building rubbish was disclosed. Three of the Chapter's workmen¹ proceeded to remove this, when there shortly came into view a brick wall $4\frac{1}{2}$ in. thick. This formed the south side of a grave or vault directly under the arch, which further clearance showed to be 7 ft. $5\frac{1}{2}$ in. long, 3 ft. $5\frac{1}{2}$ in. wide at the head, and 3 ft. 2 in. at the foot. At some time, perhaps when the quire received its new black-and-white marble floor in the seventeenth century, the slab or slabs that had covered the grave had been taken away, and the interior completely filled with dry building rubbish.

As this was being removed, there gradually came into view in the middle of the grave the small rectangular leaden chest, the top only of which had been seen earlier in the year. It was 3 ft. 5 in. long, 15 in. wide throughout, and 12 in. deep. It rested upon a band of iron, 1 in. wide, turned up at each end at a right angle, and a similar band was found standing up across the grave in its original position just to the west of the chest. Two pairs of short angle-irons were likewise found on the bottom of the grave, one pair near the head, the other near the foot, and a number of iron nails. These iron bands and angle-pieces had evidently been attached to a large wooden coffin, but this had become reduced to powder, with the exception of a few rotten pieces of the bottom under the leaden chest. The lid had apparently gone to decay or been removed when the grave had been filled up with rubbish, but not the sides, the lines of which could be plainly traced by the difference in colour in the filled-in material. It was impossible to fix the exact length of the coffin, but the position and distance apart of the iron bands showed that it measured about 6 ft. As the horizontal section of the bands measured $33\frac{1}{4}$ in. and 29 in. respectively, the coffin was wider at the head than the foot, after the mediaeval fashion, and it was apparently just deep enough to hold the leaden chest.

As there was nothing else to be found in the grave, the leaden chest was

¹ Plummeridge, Platt, and Maisey.

next carefully lifted out and placed on a table for examination. It was neatly made of sheets of cast lead, $\frac{1}{4}$ in. thick, and perfectly plain, with a closely fitting lid carefully soldered on, but without any signs of engraved or painted inscription. The once flat lid had sunk considerably under the weight of the rubbish that had been thrown upon it, and along its south edge was a longitudinal rupture about 1 ft. long. The sides and ends of the chest were quite sound and vertical, but the bottom was badly decayed in many places through contact with the wood of the coffin, and much corroded and bent inwards.

It was next decided to open the chest, and the services of a plumber¹ having been obtained, a cutting was made by him along the sides and ends just below the lid, which was then carefully raised and lifted off by the two Provosts.

Inside the chest there appeared a wooden box of a dark colour in a state of decay. It was a narrow, rectangular box with a sliding lid, 3 ft. $3\frac{1}{2}$ in. long, 10 in. wide, and about $\frac{1}{2}$ in. thick, but the sides and ends, which were about 9 in. deep, as well as the bottom, were 1 in. thick.

After the removal of the pieces of the lid, there was disclosed within the box a decayed mass of human bones, lying in no definite order, but mixed with the rotten remains of some material in which they had been wrapped. There was also a certain amount of adipocere, and of dry rubbish from the grave which had fallen in through the rupture in the lid of the leaden chest.

The fragments of the bones were reverently and carefully taken out, bit by bit, by Professor Macalister, who afterwards most kindly supplied the following note as the result of his examination of them :

5 November, 1910.

The following report contains all the information gathered from the skeleton which I examined yesterday.

The bones are those of a fairly strong man, aged between forty-five and fifty-five, who was at least 5 ft. 9 in. in height (he may have been an inch taller, but I give the minor limit).

The bones of the head were unfortunately much broken, but as far as they could be pieced together they were thin and light, and belonged to a skull well-formed but small in proportion to the stature. Some of the roof bones (occipital and temporal, frontal and parietal) had become ossified together at the sutures. The few teeth found (second molar upper right, and first molar upper left, second bicuspid lower right) had their crowns very much worn down. The portion of the one side of the lower jaw found had lost its teeth some time before death.

There were nearly all the bones of the trunk, of both legs, and of the left arm ; but I found no part of the right arm.

From the relative positions occupied by the bones, as they lay in the leaden casket when opened, it was certain that the body had been dismembered when it was put in. If

¹ Shipp.

the body had been buried in the earth for some time and then exhumed, it would account for their being in the condition in which we found them. It might also account for the absence of the bones of the right arm, as well as for the accidental enclosure of the left humerus of a small pig within the casket.

I am sorry that I can add nothing more. The state of the bones was so unsatisfactory that I could not make any trustworthy measurements.

Professor Macalister does not mention that the contents of the box were still somewhat moist, possibly on account of the 'spices' used to embalm the body at its first burial. One other feature was noticeable, that to one of the pieces of the skull there was still attached some of the hair, which was brown in colour, save in one place where it was much darker and apparently matted with blood.

While the examination of the bones was going on, the men finished the clearing out of the grave. It had been formed exactly between the piers of the arch, and their stone footings served as its ends. The south side, as already noted, was of brick, but the north side was formed of a rough stone arch, filled in with a 9-in. brick wall.¹ None of the brickwork was plastered. The bottom of the grave was of the natural chalk which underlies the chapel, with fragments of stone, etc. trodden into it, and was 3 ft. 4 in. below the aisle floor.

After the bones had been fully examined, preparations were made for replacing them in the grave.

Owing to the decayed condition of the bottom of the leaden chest, it was thought advisable to fix a new one to it outside the other, which was accordingly done, and the old bottom flattened down. The bones were then reverently placed on a large piece of new white silk and carefully wrapped up in it by the Provost of King's and Mr. Dalton, and deposited, with all the fragments, etc. found with them, in a new oak box that had been made to hold them. The lid of this was then screwed down and the box put inside the leaden chest. With it were also placed the pieces of the original box, and the iron bands and angle-pieces of the outer coffin; the lid of the chest, having been flattened out, was replaced, and soldered down. The leaden chest, now containing everything that was found in and around it, was finally lowered into the grave, which was thereupon filled up again as before.

The question now naturally arises, What evidence is there for believing that the remains found were those of King Henry VI? It is true that no mark or inscription of any kind was discovered in the grave to distinguish them as his, but any such may possibly have been on the lost or perished lid of the outer coffin. The presumption, however, in favour of the remains is, I think, fairly conclusive.

¹ The coffin may have been put into the vault through this arch, which was then bricked up.

King Henry died or was murdered in the Tower of London on 21st May, 1471, and the Issue Roll shows that £15 3s. 6½d. were paid to Hugh Brice: (i) 'for wax, linen cloth, spices, and other ordinary expenses by him appointed and spent about the burial of the said Henry of Windsor who died within the Tower of London,' and (ii) 'for wages and rewards of divers men carrying torches from the aforesaid Tower to the cathedral church of St. Paul, London, and thence to Chertsey, with the present body'.

Master Richard Martyn was also paid £18 3s. 3d. in two sums: (i) of £9 10s. 11d. for 28 ells of linen cloth of Holland and for expenses incurred both within the aforesaid Tower at the death of the said Henry and at Chertsey on the day of his burial; also for rewards given to divers soldiers of Calais watching about the body, and for the hire of barges with masters and sailors rowing by the Thames to Chertsey; and (ii) of £8 12s. 4d. to the various houses of Friars in London for masses of the dead.

The total expenses were only £33 6s. 9½d. The payment for wax, linen cloth, and spices suggests that the King's body was embalmed and wrapped in cerecloth, but nothing is said about any leaden coffin.¹

John Warkworth in his Chronicle says that King Henry was put to death in the Tower,

And one the morwe he was chestyde and brought to Paulys, and his face was opyne that every manne myghte see hyme; and in hys lyinge he bledde one the pament ther; and afterward at the Blake Fryres was broughte, and ther he blede new and fresche; and from thens he was caryed to Chyrchesey abbey in a bote, and buried there in oure Lady chapelle.²

¹ 'Hugoni Brice In denariis sibi liberatis per manum propriam pro tot denariis per ipsum solutis tam pro Cera tela linea speciebus et alijs ordinarijs expensis per ipsum appositis et expenditis circa sepulturam dicti Henrici de Windesore qui infra Turrim Londoni diem suum clausit extremum. Ac pro vadijs et regardis diversorum hominum portantium Tortos a Turri predicto usque ecclesiam Cathedrali Sancti Pauli London. et abinde usque Chertesey cum corpore presente per breve predictum xv.li. iij.s. vj.d ob.

Magistro Ricardo Martyn In denariis sibi liberatis ad vias videlicet una vice per manum propriam ix.li. xs. xjd. pro tot denariis per ipsum solutis pro xxvij ulnis tele linee de Holandia et expensis factis tam infra Turrim predictam ad ultimum vale dicti Henrici quam apud Chertesey in die sepulture ejusdem. Ac pro regardis datis diversis soldarijs Cales vigilantibus circa corpus et pro conductu Bargearum cum Magistris et Nautis remigantibus per aquam Thamiē usque Chertesey predictam et alia vice viij^{li} xi^s iij^d pro tot denariis per ipsum solutis iij^{li} ordinibus fratrum infra Civitatem London. et fratribus sancte Crucis in eadem et in alijs operibus Caritatis videlicet Fratribus Carmel^{is} xxs. Fratribus Augustin^{is} xxs. Fratribus Minoribus xxs. Fratribus Predicatoribus pro obsequiis et missis celebrandis xls. et dictis Fratribus Sancte Crucis xs. Ac pro obsequiis et missis dicendis apud Chertesey predictam in die sepulture dicti Henrici liij^{li} iij^d per breve predictum xvji^{li} iij^s iij^d.' Issue Roll (Pells), Easter, 11 Edward IV. No. 505.

² Ed. Halliwell, Camden Society 10 (London, 1839), 21.

This notice points to the King's body having been 'chestyde' in a wooden coffin only.

A somewhat later writer than Warkworth, Edward Hall, has the following note about King Henry's funeral:

The ded corps of Kyng Henry, with bills and gleves pompeously, (yf you call that a funerall pompe) was conveighed from the tower, to the church of saint Paule, and there layed on a beere, where it lay the space of an whole daye: and the next day, wythout Priestes or Clarke, Torche or Taper, syngyng or sayng, it was conveighed to the Monastery of Chertsey, beyng distant from London .xv. Mile, and there was buried, but after he was removed to Windsore, and there in a new vawte newly intumilate.¹

This reference to the 'new vawte' is not without interest in view of the recent discoveries at Windsor. The fact, too, of the removal of the King's body to Windsor is confirmed by a payment in the account roll of the Treasurer of the College of Windsor for 1483-4 of £5 10s. 2d.

solut. in expensis circa remocionem Regis Henrici vj^{ti} de Chertsey usque huc ut patet per billam.²

The bill of details unluckily is not to be found, but there can be no doubt, not only that the King's body was actually transferred to Windsor, but that King Henry VII purposed to enshrine him there. With this intent he had pulled down the old Chapel of St. Edward and St. George, which had for a long time served as the Chapel of the Order of the Garter, and built upon its site the Lady Chapel, now called the Albert Memorial Chapel. The Pope had confirmed the transfer of certain endowments to the new chapel, and the King had actually begun his own tomb in it, when the Abbot and Convent of Westminster intervened with a claim that the body of King Henry VI should be translated from Windsor to their church for burial. The very curious evidence that was submitted before the Commission appointed by the Privy Council to decide the question has been printed by the late Dean Stanley in his *Historical Memorials of Westminster Abbey*. But it may be worth while to quote such of it as bears on the question of this paper.

The Abbot of Chertsey was the first witness, and alleged and pleaded that the aforesaid body of sacred memory of Henry VI had been formerly buried within his monastery, and by Richard, lately in deed but not of right, King of England, without the consent of him and his Convent (as he asserted), had been

¹ *The Union of the two noble and illustre families of Lancastre and Yorke* (London, 1548). The prosperous reigne of Kyng Edward the Fourth, fo. xxxiiij.

² Account Roll xv. 34, 60.

violently exhumed and dragged forth, and notwithstanding the protests of him and his Convent had been brought to and was in the aforesaid College [of Windsor]: he accordingly asked and urged that restitution of the holy body to his monastery should forthwith be made.

The Dean of Windsor and his two co-canons asserted that the Abbot and Convent of Chertsey had not only consented to the removal of the King's body, but the Abbot was himself the first, of his own free will, with his own hands, to open the grave; that neither the Abbot and Convent of Chertsey nor of Westminster ought to be heard in the matter because (as they asserted) that holy man Henry VI aforesaid while living had practically chosen his burying place to be made in the aforesaid College; and they urged that even though no choice of sepulture could be proved, possession was enough for them.

The representatives of the Abbey of Westminster demanded the exhumation of the blessed body and its conveyance to their monastery for a threefold reason: (i) because King Henry had chosen therein the place of his burial; (ii) because their monastery had for a long time been and was the burying place of the Kings and ancestors of the said Henry VI and was commonly known as such; and (iii) because the King was their parishioner.

The decision of the Privy Council was eventually in favour of Westminster, and on 26th July, 1498, the King executed a formal indenture with the Abbot and Convent in which he recites how 'to the pleasure of God and for the singular affection and devocion that his grace hath to his Uncle of blessed memory King Henry the vijth [he had] lately begon to make and bilde of new the chapell of our Lady within the Colleget church of Wyndesore entending to have translatid the body of his said Uncle in to the same and nygh unto him within the said chapell to have be buried hymself'. But in consequence of the recent decision of his Council he had 'fynally determyned to convey and bring the said holy body of his said Uncle King Henry the vijth from the said Colleget Church of Wyndesore to the said Monastery of Westminster and there to be commytted to perpetuall sepulture in the chapel of our Lady within the church of the said Monastery the which chapell oure said souverain Lord entendith to make and bilde of new and in the same not farre from his said Uncle to be buried hymself'. Because this transfer cannot be done without great cost the Abbot and Convent bind themselves by the indenture to pay the King £500 for the purpose.

Dean Stanley has shown by a quotation from the sacrist's account for 1501-2, that this large sum was actually paid over, but King Henry the Sixth's body never left Windsor, and when King Henry VII made his will on 31st March, 1509, three weeks before his death, for the last time he recounts how he proposes 'right shortly to translate' into the Monastery of Westminster 'the bodie and reliques of our Uncle of blissed memorie King Henry the VIth'.

There is yet one more notice that may be cited, the curious contemporary account by John Rous, the antiquary of Warwick, of the translation of King Henry's body from Chertsey to Windsor, and of the appearance of the remains when first exhumed.

Among the events that happened in the year 1484 he writes :

In the month of August next following, the body of King Henry VI was dug up (*effossum est*) and translated to the new collegiate church of the Castle of Windsor. There it was honourably received and with very great solemnity buried again on the south part of the high altar. That same body was then very odoriferous, not indeed from the spices employed when it was buried by his enemies and tormentors. And it was in great part uncorrupt, everywhere entire as to the beard and hair, with the face as usual, though somewhat sunken, with a more meagre appearance than ordinary. And there abounded forthwith miracles declaring the King's sanctity, as is sufficiently evident from the written accounts there.¹

There can, then, be no doubt :

- (1) that King Henry VI was buried in an ordinary grave at Chertsey;
- (2) that his remains were exhumed and conveyed to Windsor Castle, and there honourably buried again in St. George's Chapel to the south of the high altar; and
- (3) that the remains were never removed to Westminster.

In favour of the claim that the contents of the grave lately opened at Windsor are those of King Henry it seems to be established :

- i. that they are those of a man of about the King's age and, so far as we know, of his personal characteristics;
- ii. that they belong to some one who may have died a violent death, as is shown by the blood-clotted hair;
- iii. that their condition, according to Professor Macalister, is not inconsistent with their burial in the earth in a coffin for some time, which in King Henry's case was thirteen years;
- iv. that the care with which the remains were collected and enclosed in the leaden chest points to their being those of a person of some importance;

¹ 'Et in mense Augusti proximo sequente effossum est corpus regis Henrici Sexti, et usque novam ecclesiam collegiatam castri de Wyndzour est translatum, ibi honorifice receptum, et cum maxima solempnitate iterum tumulatum ad australem partem summi altaris. Erat illud tunc sacrum corpus valde odoriferum, non quidem ex speciebus apposis, cum per inimicos atque tortores suos erat sepultum. Et pro magna parte erat tunc incorruptum, capillis et crinibus ubique fixum, facie consueta sed parvum depressa cum macilentiori aspectu solito. Et statim affluebant miracula regis sanctitatem profitentia, ut in scriptis ibi sufficienter evidet.' *Johannis Rossi antiquarii Warwicensis Historia Regum Angliæ*, ed. T. Hearne, 2nd edition (Oxford, 1745), 217.

v. that they were deposited in a place of honour, and in a vault specially made for them.

The placing of this chest within a full-sized coffin may possibly have been done from a desire to support the reputation of the uncorruptibility of the body described by John Rous; but it is equally possible that it was done for greater dignity and reverence.

Lastly, there is no other person than King Henry VI recorded or known to have been buried in St. George's Chapel to whom remains enclosed in so remarkable a way could possibly belong.

XXV.—*The Plan of the First Cathedral Church of Lincoln.* By JOHN BILSON,
Esq., F.S.A.

Read 25 May, 1911.

It is hardly too much to say that no period in the history of mediaeval church architecture in England is so important as that which immediately followed the Norman Conquest. It is important in respect of the marvellous extent and quality of its own achievement; of its influence on the subsequent history of English architecture; and also (which perhaps cannot be asserted of any other period) of its influence on the architectural development of western Europe generally. By the time of the Conquest the Norman school was fully formed, and was achieving such masterpieces as Jumièges and Saint-Étienne, Caen. The Conquest provided an opportunity of which the immense energy of the Norman bishops and abbots took full advantage. In their greater churches they built on a scale which they had hitherto rarely attempted in their own country. Such activity bred experience, readiness in solving structural problems. The Norman character naturally led them to develop the logic of construction, and they were innovators in the practice of expedients which only needed fuller development to reach the essentials of what we call Gothic. It is true that this great development was not English; it was essentially Norman, the accident of the Conquest, but its importance is none the less on that account, and needs fuller recognition than perhaps it has yet received.

One of the most remarkable characteristics of this development of the Norman school in England is the expansion of plan which is exemplified in the larger churches which have survived, either wholly or in part, and in others the complete plans of which are known. Some considerable additions to our knowledge in this respect have been made during recent years, especially by excavations. Such are the plans of the eastern parts of the abbey churches of St. Augustine, Canterbury, and St. Mary, York,¹ the plan of the east end of Durham Cathedral,² and the recent investigation of the plan of the Confessor's church at Westminster.³ I am now able to put before you another plan, that of the first cathedral church of Lincoln. It is true that some little was already known of

¹ *Archaeological Journal*, lxiii. 106.

² *Ibid.*, liii. 1.

³ *Archaeologia*, lxii. 81.

this plan, but it is only by recent excavations that a sufficient number of points have been fixed to enable a complete plan to be made with some approach to certainty as regards its main lines.

The builder of the church was Bishop Remi, the almoner of the abbey of Fécamp, who provided a ship and twenty knights for Duke William's expedition which resulted in the conquest of England. He was the first of the Norman ecclesiastics to receive a bishopric in the conquered country, succeeding Wulwig as bishop of Dorchester in 1067. The Council of Windsor in 1072 having ordered that bishops should fix their seats in cities, and not in villages, the see of Dorchester was removed to Lincoln. The precise date of the transfer has been very variously stated, but it is now generally placed between 1072, when Remi signed at the Council of Windsor as bishop of Dorchester, and 1075, when he appears at the Council of London as bishop of Lincoln. As Lincoln is not mentioned at the later council among the sees yet to be transferred, the inference is that the change had already taken place.¹ The date when the building of the new cathedral church was begun can be fixed with more precision. The charter granted by William Rufus in 1090² recites a charter of the Conqueror, which relates that the latter ordered Bishop Remi to build the church of the blessed Mother of God, as the seat of his whole bishopric, and that this was done with the consent of Pope Alexander and his legates, and of Archbishop Lanfranc; and that the Conqueror, ordering the building of the church, gave a sufficient area for the building, for the dwellings of the clergy, and for the cemetery. The beginning of the building may therefore be placed between the Council of Windsor in 1072 and Pope Alexander's death in 1073.

Here then, on 'the sovereign hill of Lincoln', eastward of the castle, and just within the Roman wall on the east of the city,³ Bishop Remi built his church, as Henry of Huntingdon aptly puts it, 'strong as the place was strong, fair as the place was fair, dedicated to the Virgin of virgins, which should be both a joy to the servants of God, and as befitted the time unconquerable by enemies.'⁴ Later chroniclers tell us that the church was built quickly,⁵ and it was ready for con-

¹ *Victoria History of the Counties of England: Lincolnshire*, vol. ii, p. 9, where references to the authorities will be found. See also *The Architectural History of Lincoln Minster*, by the Rev. George Ayliffe Poole (*Associated Architectural Societies' Reports*, iv), Appendix of Documents, p. 36; and *Recorded History of Lincoln Cathedral*, by the Rev. J. F. Dimock (*ibid.*, lx. 190).

² Dugdale, *Mon. Angl.* (1830 ed.), vi. 1270; Bradshaw and Wordsworth, *Lincoln Cathedral Statutes*, part ii, p. 1.

³ The outer face of the apse must have been only some 12 to 15 yards within the Roman wall.

⁴ Henry of Huntingdon, *Hist. Angl.* (Rolls Series), 212.

⁵ Giraldus Cambrensis, *Vita S. Remigii* (Rolls Series), vii. 19; John de Schalby (in the same volume), 194.

secration when Bishop Remi died on May 6, 1092,¹ three days before the date fixed for the ceremony. Henry of Huntingdon says that it was already finished,² and this is confirmed by the fact that nothing is recorded of any building work by Remi's successor, Robert Bloet, though the latter is said to have given vestments and ornaments to the church. It is, however, confirmed more decisively by the character of the original work at the west end of the church,³ which presents strong analogies with what had then just been built, or was then being built, at the west end of Saint-Étienne and at Saint-Nicolas, at Caen.

It is evident, then, that any exact knowledge of the architecture of Bishop Remi's church must be the more valuable because it was one of the earliest churches built in England by the Norman conquerors, and because, too, it was built quickly during the twenty years between about 1073 and 1092. The recovery of its plan is also important for another reason; the knowledge of what already existed must necessarily throw some light on the precise manner in which the present church was built, and so facilitate the solution of the difficult problems which still remain to be unravelled with regard to the history of the works of St. Hugh and his immediate successors.

Before, first, describing what has hitherto been discovered of Bishop Remi's building, and then showing how these remains enable us to reconstitute the plan of his church, I may explain how the recent investigations came to be undertaken.

In 1908, Professor Lethaby and I spent a few days together at Lincoln to study what remains of the eleventh- and twelfth-century works in the cathedral. With the exception of the very important original work at the west end,⁴ the only traces of Bishop Remi's church then known were the fragments of the foundations of the choir and its great apse beneath the choir stalls,⁵ and the foundations of

¹ Giraldus Cambrensis, *ibid.*, vii. 21, and preface, p. xix. ' . . . sepultus est a fratribus in eadem ecclesia, in prospectu altaris sanctae crucis.' (*Ibid.*, vii. 22.)

² 'Cum ecclesiam Lincolnensem iam perfectam dedicaturus esset.' Henry of Huntingdon, *Hist. Angl.* (Rolls Series), 216.

³ The western towers, however, do not appear to have been carried up higher than the level at which the original work now finishes, just below the twelfth-century arcade which runs across the west front immediately above the arches of the great lateral recesses.

⁴ We hope to make this the subject of a separate study when our investigation has been completed.

⁵ The late Precentor Venables records that these were discovered by Mr. T. J. Willson in 1852 (*Archaeological Journal*, xlv. 196). A conjectural sketch-plan, based on these remains at the east and west ends, was published by the Rev. George Ayliffe Poole in illustration of his paper, *The Architectural History of Lincoln Minster* (*Associated Architectural Societies' Reports*, iv. 11), but he, and Precentor Venables following him (*Archaeological Journal*, xl. 173), assumed a transept of the same width as the later transept, and a choir of only two bays in front of the apse.

the north-west angle of the north transept which had been found in 1903 and marked on the pavement.¹ We came to the conclusion that comparatively small excavations would probably give further fixed points for a definite plan, and, on our suggestion, Mr. W. H. St. John Hope obtained permission from the Dean and Chapter to make excavations during the Lincoln meeting of the Royal Archaeological Institute in July, 1909. These resulted in the discovery of foundations of the east end of the north choir aisle, and of the eastern bays of the wall of the north aisle of the nave. The investigation then left incomplete was continued by further excavations kindly undertaken by the Dean and Chapter, and carried out in January, February, and March, 1911, in the north transept and its eastern aisle and in the western bays of the nave. The trials were only made in those places which were likely to furnish data for the principal lines of the plan, and, although there is no doubt that much more remains below floor-level, it could only be discovered by much more extensive excavation and disturbance of the pavement than could be suggested under the present conditions. As the north-west angle of the north transept had already been fixed, the excavations were confined for the most part to the north side of the church, with the object of obtaining sufficient data for this half of the plan.

I will now proceed to describe in detail the remains which have furnished the fixed points on which my plan is based. I must first, however, gratefully acknowledge the kindness of the Dean and Chapter in consenting to undertake the excavations carried out under Mr. Hope's direction in 1909, and those under my direction in 1911, and in defraying the cost of the work. Personally I owe especial thanks to Archdeacon Bond, the Precentor, for the very active interest which he has taken in the investigation. I ought also to add an appreciation of the intelligent and helpful way in which the actual work was conducted by Mr. Henry J. Davis, the master-mason of the cathedral.

The remains of the eleventh-century church which are now known are shown on plates LXXV and LXXVI, where they are distinguished by dark hatching. The dotted lines have been added to continue the lines of what was actually found, in order to make the plans more intelligible, but it must be understood that these dotted lines are mere inferences from what is distinguished by the dark hatching, and that they do not themselves represent anything which is actually known to

¹ From these and from some indications of smaller finds kindly given me by Mr. John Allan, the cathedral clerk of works, and Mr. Henry J. Davis, the master-mason, I made a conjectural plan for the Lincoln meeting of the Royal Archaeological Institute in July, 1909, which has proved to be not very far from the truth.

exist. Foundations of later or uncertain date are shown by light dotted shading.¹ The single unshaded lines represent the plan at the floor level of the adjacent parts of the present church.²

Beginning at the east end, we have the fragments of the great apse and eastern part of the choir³ which remain beneath the choir stalls, between the sleeper-walls beneath and on either side of the lower range of stalls on each side of the present choir (plate LXXV).

On the north side, a length of the outer face of the apse remains at A, B, with the south-east quoin of a pilaster-buttress at B, 9 in. wide and $4\frac{3}{4}$ in. in projection. Two courses of face-work remain here above the foundation, the upper course being 10 in., and the lower 9 in., in height. The top of the upper course is 2 ft. 2 in. below the floor of the present choir between the stalls, or about 11 in. below the level of the present nave floor. The face-work is axed, with rather broad strokes, and the joints are about $\frac{3}{4}$ in. thick.⁴

On the inside of the apse, a length of the face remains at C, D, most of it two courses in height corresponding with the two courses of the outer face. The thickness of the wall between the outer and inner faces is 7 ft. 4 in. The apse widened out to the choir by three recessings of the wall-face. The westernmost sets in 13 in. at G, from which there is a length of 5 ft. 4 in. to another set-in of 13 in. at F, and a length of 1 ft. 8 in. to E. Here the masonry of the springing of the apse has been robbed, but what remains and a development of the apse curve show that the recess at E was also 13 in.⁵ From G westward to K the inner wall-face remains only to the height of a single course, corresponding to the lower of the two courses remaining further east. The rubble core of a wall-pier remains at H, J, and the wall-face where robbed shows that this pier was 3 ft. 4 in. wide,

¹ All the foundations shown are from my own measurements, except the north-west angle of the north transept where my plan shows the lines which are marked on the floor.

² On pl. LXXVI, the existing plan of the west end, beyond the doorways to the Morning Chapel and Consistory Court, is drawn in detail. Actually existing eleventh-century work or (as regards those parts which have been cased) parts which may be presumed to be of eleventh-century date are distinguished by dark hatching. All later work, mediaeval or modern, is shown by dotted shading, without distinction of date.

³ Mr. Ayliffe Poole's paper contains a plan of these fragments (*Associated Architectural Societies' Reports*, iv. 11). A better plan by Mr. J. J. Smith illustrates Precentor Venables' paper in the *Archaeological Journal*, xlv. 194 (plan no. 1), and was also published in *The Builder*, lii. (May 21, 1887) 755. It is curious that both plans are inaccurate; the former shows only two projections between the choir and apse, and the latter shows two on the north and three on the south. The fragments are also shown, again incorrectly, on a plan of the choir in *Archaeologia*, xlvii, p. 44, pl. ii.

⁴ In the original masonry bared during these excavations, the joints are generally from $\frac{3}{4}$ to 1 in. in thickness.

⁵ This is the projection which is omitted in Mr. J. J. Smith's plan.

with its east face 10 ft. 8 in. from *g*. A trace of a face at the side of the rubble core indicates that the wall-pier *h, j* had a projection of at least 1 ft. 8 in. The single course of the wall-face extends westward only to *k*, 2 ft. 2 in. beyond the west side *j* of the wall-pier.

On the south side, the indications of the same plan are less complete. The rubble core of the apse remains, but the face has gone, except on either side of the angle *l* (corresponding to *f* on the north side), and except about two-thirds of the broad face to the west of *l*. At *m* is the rubble core of a wall-pier, as on the north side, but the face of the wall itself cannot be seen, though the face of the later sleeper-wall appears to follow the same line.

The clear internal width of the choir, as indicated by the fragments described above, was about 29 ft. 6 in., and the internal width at the springing of the apse curve was about 23 ft.¹

The remains of the north aisle of the choir were discovered in the excavations of July, 1909, and they prove that the eastern termination of the aisle was square externally, and apsidal internally. At *x* (plate LXXV) was found the external face of the aisle wall, and, at the east end of this north face, a pilaster buttress, 4 ft. 10 in. in width, with a narrow pilaster projection on each side of it. The remaining masonry here is 3 ft. 1 in. below the aisle floor (about 1 ft. 11 in. below the level of the present nave floor) to the top of a course 8 in. in height, below which the foundation was not bared. Close to the northern face of the buttress is the foundation of the later aisle wall. At *o* is a fragment of the rough external face of the east wall. On the inside of this wall, the northern part of the internal face of the apse remains at *p, q*, with its springing at *q* set in 10¼ in. from the internal face of the aisle wall. The level of the remaining masonry here is the same as that of the outer face of this wall. The thickness of the aisle wall at this level is 4 ft. 8½ in. Nothing more could be found here on account of interments, and to the south the masonry of the apse is interrupted by a foundation wall which was traced from *r* to *s*. The north face of this wall, which runs obliquely down the aisle, is built for the most part of eleventh-century stones, but it seems to be simply a broad foundation added to the north face of the earlier choir wall, to receive the main piers of St. Hugh's choir.

Further west, at *t*, a fragment was found of the wall of the east aisle of the north transept. A single stone, 1 ft. 6½ in. long, remains of an external chamfered plinth course, 9 in. in height, its top being 8 in. below the aisle floor (about 6 in. above the level of the present nave floor). One course of face-work remains below

¹ These dimensions are as accurate as I have been able to fix them by careful measurement, but the hatches in the floor of the stalls, by which alone access is gained to these remains, are some distance to the west of the apse itself.

the plinth, set on a foundation of two stepped footings, the upper being 2 ft. $1\frac{3}{4}$ in., and the lower 2 ft. $6\frac{1}{4}$ in., below the aisle floor level, each footing projecting $9\frac{1}{2}$ in. The thickness of the wall here is 5 ft. $7\frac{1}{4}$ in. below the plinth, the chamfer of which has a projection of 3 in. This plinth, however, was not that of the wall itself, but of a pilaster buttress at its south end, next the internal angle which it forms with the wall of the north choir aisle.

The other remains of the east aisle of the north transept were bared in the excavations of January—February, 1911.¹ At *u* is a single stone, 1 ft. 4 in. long, of the chamfered plinth of the outer face of the east wall, at the same level as the plinth at *τ* (described above), with a single course of ashlar, $7\frac{1}{2}$ in. high, above the plinth. The inner face of this wall could not be found, but, from what remains at *τ*, it would seem that the wall was about 4 ft. 2 in. thick below the plinth. Further to the north at *v*, is the pilaster buttress of double projection at the northern end of the east face of this wall, the remaining length of the principal face of the buttress being 3 ft. $10\frac{1}{2}$ in. This fragment at *v*, like that at *u*, consists of a course of ashlar $7\frac{1}{2}$ in. high, above the plinth, and a chamfered plinth 9 in. high, with a course of ashlar below. The chamfers of the plinths at *u* and *v* measure 3 in. in height and 4 in. in projection. Of the north wall of this aisle, only a fragment, 1 ft. 4 in. long, of the external face could be found, at *w*, with the rubble core behind it, but the internal face had been removed for a grave. Part of the rubble core of this north wall was also found at *x*, but no face-work. The fragment at *w* and the north side of the opening at *u'* indicate about 3 ft. 9 in. as the thickness of this north wall of the aisle.

We come now to the remains of the north transept itself.

The north-western angle, *y*, was found in 1903, and its lines were marked on the pavement. The north wall was 4 ft. 9 in. in thickness. Externally, on the north side of the angle, was a pilaster, $8\frac{1}{2}$ in. in projection (in line with the internal face of the west wall) and $11\frac{1}{2}$ in. on the face, beyond which the buttress extended for a length of 4 ft. to the north. This evidently enclosed the staircase which is most frequently found at this angle of the transept.

The other remains of the north transept were discovered in the excavations of January—March, 1911, which were very successful.

At *z* is the north-east internal angle, with a projection in the angle, $11\frac{1}{2}$ in. wide on its south face, and 11 in. wide on its west face. This remains as a single course of ashlar, $10\frac{1}{2}$ in. in height, the top of which is 1 ft. 3 in. below the floor level.² This angle, with the north-west angle, determines the internal width of the transept as 28 ft. 9 in.

¹ Those at *u* and *v* had already been discovered in 1900, during the construction of a wind-trunk for the organ, but they had not been marked on the pavement.

² The floor level of the north transept is the same as that of the nave.

At α' is the northern buttress of the north-east external angle, 4 ft. 11 in. wide below the plinth, flanked by a narrow pilaster projection on its west side (that on the east side had gone). The quoin stone of the chamfered plinth remains at the eastern angle. The plinth course, the top of which is 6 in. below the floor level, is 9½ in. in height, with a course of ashlar below. The chamfer of the plinth measures 3 in. in height, and 3 in. in projection.¹

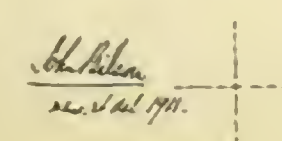
In the centre of the external face of the north wall, at β' , is a buttress, 4 ft. in width, flanked by a narrow pilaster projection on each side. On the inner face of the wall, at γ' , is a wall-pier, 4 ft. 1½ in. in width, and 2 ft. in projection. The top of the remaining masonry, which is axed ashlar on both faces, is from 11 to 12 in. below the floor level.

The inner face of the east wall of the north transept was followed from the north-east internal angle described above to the opening into the east aisle, both angles of which were found, giving an opening of 15 ft. 5 in. On the northern return face, at δ' , where the top of the remaining ashlar walling is 1 ft. 1 in. below the floor level, is a chase about 8 in. wide and 1¼ in. deep, apparently for a screen across the opening. To the south of this opening, where the top of the remaining masonry is also 1 ft. 1 in. below the floor level, is a wall-pier at ϵ' , 4 ft. 6 in. in width, with a projection of 1 ft. 10 in. The northern angle of the opening from the north transept to the north choir aisle is at ζ' , 1 ft. 10 in. to the south of this wall-pier. The outer face of this east wall is lost in the foundation of the thirteenth-century arcade.

In the centre of the north transept, at η' , in line with the wall-pier ϵ' , is the foundation of the pier which carried the transept gallery. This measures 8 ft. 0½ in. in length from east to west, and 4 ft. 6½–7½ in. in width from north to south. On its south face was a wall-pier, with a projection of 1 ft. 9 in., only the eastern quoin of which remains, the western having been robbed for a grave. Doubtless there was a similar pier on the north face, but all trace of this had been removed for a grave. Of the ashlar facing of this pier, two stones at the north-east angle, one on the eastern part of the south face, and most of the west face and north-west angle, are all 10½ in. in height, their top being about 1 ft. below floor level. The remaining facing only exists to the level of the bottom of this course.

In order to ascertain whether the gallery over the transept only extended as far as the line of the aisle walls, as at Saint-Étienne, Caen, Winchester, &c., or whether it extended over the whole area of the transept arm up to the cross-

¹ It should be remarked that, whereas the other chamfered plinths found at τ , u , and v are at the same level, which is also about the level of the chamfered plinth on the outside of the west front, the level of this plinth at α' is about 1 ft. lower.



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ing piers, as at Jumièges¹ and originally at Bayeux,² an excavation was made at n', midway between the northern piers of the original crossing, but no result was obtained, owing to interments at this point. Trial was therefore made at j', midway between the southern piers of the crossing, and here we found a wall, 5 ft. 1½ in. in thickness, faced with ashlar on each side, which formed a kind of continuous sleeper-wall between the south-east and south-west piers of the original crossing. The top of the remaining masonry is 1 ft. 3 in. below the floor level.

The remains of the three eastern bays of the north aisle of the nave were discovered in the excavations of July, 1909. In the eastern bay we found the southern face of a foundation wall k' l', running obliquely, and built of eleventh-century axed stones with fairly thick joints, but this is evidently only the foundation of the thirteenth-century aisle wall, faced with old material. A little further west, at m' n', we came upon the inner face of the eleventh-century aisle wall, the top of the remaining ashlar walling being 1 ft. below the floor level. At n' o' the facing is interrupted for a length of 3 ft. 7 in., where a wall-pier has been removed. From o' the face extends for a length of 14 ft. to a wall-pier p', 4 ft. 3 in. in width and 2 ft. in projection; then a further length of 14 ft. 1 in. to another wall-pier q' of the same width and projection. These give a bay-width of 18 ft. 4 in. from centre to centre. The external face of the original aisle wall is lost in the foundation of the thirteenth-century aisle wall.³

The other remains of the nave aisles were found in the excavations of January—February, 1911. Having ascertained the bay-width, there was nothing to be gained by following the whole length of the north aisle wall. Excavations were therefore resumed in the third bay, from the west, of the present north aisle. At r' (pl. LXXVI) we again came upon the inner face of the eleventh-century aisle wall, followed by a length of 4 ft. 4 in., where the interrupted face showed that a wall-pier had been removed, the internal angle of the pier still remaining at s'. From this point the wall-face extends for a length of 14 ft. 1½ in. to another wall-pier r', 4 ft. 3 in. in width and 2 ft. in projection; then for a further length of 12 ft. 10½ in. to the eastern face u' of another wall-pier,⁴ the remainder of which had been removed for an interment. The length (not excavated) between q' and r' gave an average width for the four intervening bays of 18 ft. 5½ in. each, centre to centre. The width of the third bay from the west is 18 ft. 5 in., centre

¹ Roger Martin du Gard, *L'abbaye de Jumièges* (Montdidier, 1909), p. 74 and pl. iii.

² *Cathédrale de Bayeux: Reprise en sous-œuvre de la Tour Centrale par M. Flachet. Description des travaux par MM. H. de Dion et L. Lasvignes* (Paris, 1861).

³ So also in the western bays of the north aisle.

⁴ The top of the remaining masonry bared in these western bays is 9½ to 10 in. below the level of the floor.

to centre, and that of the second bay, 17 ft. 1½ in., assuming that the wall-pier at u' was the same width as the others.

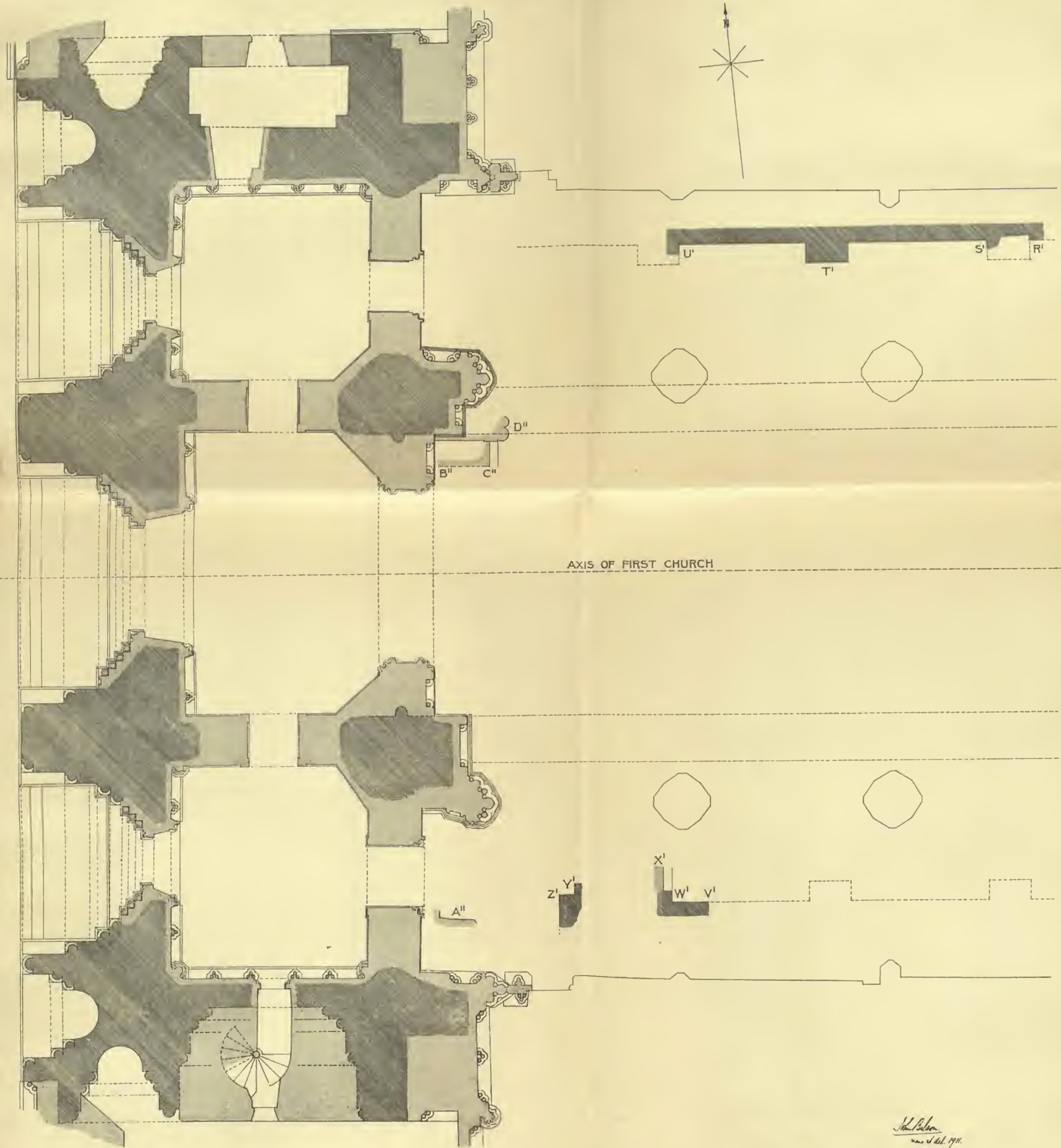
From u' the trench was continued for a length of 7 ft. 8 in. westward, without finding anything. Beyond this, a length of 7 ft. in front of the door to the Morning Chapel was not opened, and an excavation from this point up to the west end of the present aisle gave no result, for all original facework had been removed for interments.

In consequence of these negative results at the west end of the north aisle, an excavation was made in the western part of the south aisle, in February, 1911. The inner face of the eleventh-century aisle wall was bared at v', and enables us to determine the internal width of the nave and aisles as 66 ft. 5 in. West of this, at w', is what seems to be the eastern quoin of a wall-pier, but its projection is only 1 ft. 1 in. Against the north face of this pier abuts a later wall x', built of eleventh-century stones with thin joints; this seems to be a thirteenth-century sleeper-wall across the aisle. At a distance of 9 ft. 11 in. from the eastern face of the pier w' is the western quoin of a pier y',¹ which also projects 1 ft. 1 in., but the wall-face here is about 8 in. further to the north than the wall-face at v'. The part to the east of y' has been removed for a grave. At z' (1 ft. 7 in. west of y') the wall shows a quoin returning southward for a length of 3 ft. 3 in. and more.² It is difficult to account for this return, unless it was an opening in the aisle wall. Further west, and just to the east of the west end of the present aisle, a further foundation was found which is shown at a'', the top of which is 1 ft. 6 in. below the floor level; it is faced with axed stones, but it does not seem to be possible to connect it with the eleventh-century plan. South of w', trial was made for the external face of the aisle wall, but nothing could be found, and Mr. Davis informs me that, when an excavation was made here for pipes, no old face was seen. It is probable that here, as elsewhere, the eleventh-century masonry was simply extended to form the foundations for the thirteenth-century work.

In July, 1909, an excavation was made around the base of the western respond pier of the north arcade of the nave. The southern face of a broad foundation was bared at b'', c'', but, although it is built of eleventh-century stones, its date is uncertain. At d'' were found two single stones of shafts, re-used in the masonry of the foundation, which doubtless came from the main piers of the eleventh-century nave; these shafts were 1 ft. 5½ in. and 11½ in. in diameter re-

¹ Mr. Allan had previously told me that y', z' had been bared 1903 for the late Mr. J. J. Smith, formerly clerk of works to the cathedral under the late Mr. J. L. Pearson, R.A.

² The heights from the top of the remaining masonry to the floor level are, at v', 9 in.; at w', 1 ft.; and at y', z', 1 ft. 11 in.



LINCOLN CATHEDRAL—PLAN SHOWING THE REMAINS OF THE FIRST CHURCH (WESTERN PART)
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spectively. Another re-used stone found here came from the mid-twelfth-century work, and had been reworked on one face in the thirteenth century.

Such are the data from which I have reconstructed the plan of the original church shown on pl. LXXVII,¹ which I will now proceed to discuss.

The plan of Bishop Remi's church consisted of a choir of three bays, terminating eastward in an apse, and flanked by aisles which extended eastward as far as the springing of the great apse; a transept, each arm of which consisted of two bays, one of which was opposite the aisles of the choir and nave, and the other, beyond to the north and south, had an eastern aisle of a single bay; a nave of ten bays in length, with north and south aisles; and two western towers at the ends of the aisles, with the nave extended an additional bay between them. These towers do not appear to have been carried up quite so high as the tops of the nave walls, but, below, this western work still remains for the most part, though it has undergone considerable alteration.

The plan is a remarkable orderly and logical piece of work. Indeed it is due to the fact that it so closely conforms to the Norman² type that we have been able to recover its main lines with comparatively little excavation.

In reconstituting this plan, and in comparing it with other works of the same school, it will be necessary to refer to several great churches which it will be convenient to enumerate here, with some notes as to their relative dates.

The beginnings of the Norman type are represented by the abbey church of Bernay (Eure), begun by the Duchess Judith before her death in 1017, and finished probably soon after the middle of the eleventh century.³ The great expansion of the architectural ideas of the Norman school is exemplified by the magnificent abbey-church of Jumièges, begun in 1040, and finished in 1067, when it was consecrated in the presence of the Conqueror.⁴ The abbey-church of Mont-Saint-Michel, a smaller church, was begun in 1023, and its nave seems to have been built between 1048 and 1090.⁵ It is, however, the Conqueror's own church of Saint-Étienne, Caen,⁶ which was founded in 1064, that will furnish

¹ On pl. LXXVII my plan of the eleventh-century church is reproduced in red, over the plan of the existing church reduced from the admirable plan made by Mr. E. J. Willson, F.S.A., in the thirties of the last century, and now in the possession of the Society.

² Using the term 'Norman' in its proper sense, and not as a nickname for a 'period'.

³ Chanoine Porée, *L'église abbatiale de Bernay*, in the volume of the *Congrès archéologique de France tenu à Caen*, 1908, pp. 588-614.

⁴ Roger Martin du Gard, *L'abbaye de Jumièges*, pp. 31-2.

⁵ Paul Gout, *Le Mont-Saint-Michel* (Paris, 1910).

⁶ G. Bouet, *Analyse architecturale de l'abbaye de Saint-Étienne de Caen* (Caen, 1868), and in the *Bulletin Monumental*, vols. xxxi and xxxii; L. Serbat, in the volume of the *Congrès archéologique de France tenu à Caen*, 1908, pp. 21-50.

most material for comparison with eleventh-century Lincoln. Indeed, as we shall see, the analogies in many points are so close as to suggest that Bishop Remi's master of the works must have been employed on the Conqueror's church before he began his work at Lincoln. Three churches of the school of Saint-Étienne, Caen, will serve to illustrate the type,¹ especially as their eastern arms (now missing at Saint-Étienne) are complete; Saint-Nicolas, Caen, a parish church begun by the monks of Saint-Étienne about 1083; the abbey-church of Cerisy-la-Forêt² (Manche), which was built during the second half of the eleventh century, and the abbey-church of Lessay³ (Manche), which was begun at the end of the eleventh or beginning of the twelfth century. Probably a little earlier than or contemporary with the earlier of these three is the older part of the abbey-church of Montivilliers (Seine-Inférieure), not far from Remi's own abbey of Fécamp. The abbey-church of Saint-Georges-de-Boscherville⁴ (Seine-Inférieure) is a later example of the same type.

Of the great churches built in England under Norman influence, only very few were earlier than Lincoln, and these are now only represented by more or less fragmentary remains. The earliest, of course, was the Confessor's church of Westminster, the plan of which has recently been so excellently elucidated.⁵ Lanfranc's cathedral church of Canterbury, begun in 1070 and finished in seven years, closely followed (as Professor Willis showed) the type of Saint-Étienne, Caen.⁶ The abbey-church of St. Augustine, Canterbury,⁷ seems to have been begun between 1070 and 1073.

Of the churches mentioned above, only St. Augustine's, Canterbury, had an ambulatory plan. All the others, like Lincoln, seem to have terminated eastward in three parallel apses.⁸ The earliest Norman plan of this type is Bernay,

¹ It is not, of course, suggested that any of these three churches influenced the plan of Lincoln. They are introduced simply as later illustrations of the 'type' of Saint-Étienne, Caen—the type which Lincoln so closely followed.

² André Rhein, *L'église abbatiale de Cerisy-la-Forêt*, in the volume of the *Congrès archéologique de France tenu à Caen*, 1908, pp. 545-87.

³ E. Lefèvre-Pontalis, in the volume of the *Congrès de Caen*, pp. 242-6.

⁴ A. Besnard, *Monographie de l'église et de l'abbaye Saint-Georges-de-Boscherville* (Paris, 1899).

⁵ *The Church of Edward the Confessor at Westminster*, by the Very Rev. J. Armitage Robinson, D.D., F.S.A., in *Archæologia*, lxii. 81-96.

⁶ R. Willis, *The Architectural History of Canterbury Cathedral* (London, 1845).

⁷ Sebastian Evans, jun., *Excavations at St. Augustine's Abbey, Canterbury*, in *Archæologia Cantiana*, xxvi. 1; *Archæological Journal*, lxiii. 106, with plan by Mr. Harold Brakspear, F.S.A.

⁸ This, though probable enough, is not absolutely certain of Mont-Saint-Michel, Saint-Étienne, Caen, or Canterbury Cathedral. The precise plan of the terminations of the choir aisles of Jumièges is also uncertain (see *Archæologia*, lxii. 96), and the plan of those of Westminster is an inference only. Sainte-Trinité, Caen, also had three parallel apses, but the plan was not quite of the normal type.

where the aisle apses were curved both externally and internally.¹ At Montivilliers, Saint-Nicolas, Caen, Cerisy-la-Forêt, Lessay, and Saint-Georges-de-Boscherville, the aisle apses are finished square externally, as at Lincoln, and also at St. Albans, Durham, and Peterborough.²

As an index of the general scale of Lincoln, as compared with these churches, we may take the internal width of the main spans, and the total internal width including the aisles.

The internal widths of the main spans at Lincoln, as ascertained, were about 29 ft. 6 in. for the choir,³ 28 ft. 9 in. for the north transept, and 28 ft. 9 in. as given by what remains above the floor at the west end of the nave. This width indicates a scale greater than that of Bernay (26 ft.), Montivilliers (choir, 27 ft.), or the later church of Lessay (choir, 24 ft. 6 in.); but it is much the same as Mont-Saint-Michel (nave, 28 ft.), Saint-Nicolas, Caen (27 ft. 11 in.), Saint-Georges-de-Boscherville (choir, 28 ft. 3 in.), and St. Augustine, Canterbury (choir crypt, 29 ft. 3 in.). It was less than Jumièges (choir, 31 ft. 2 in.), Westminster (choir, 31 ft. 2 in.), Canterbury cathedral (about 31 ft.),⁴ Cerisy (nave, 31 ft. 5 in.), and Saint-Étienne, Caen (nave, 32 ft. 10 in.). This last width was exceeded in some of the greater English churches, such as Winchester and Peterborough.

The total internal width of Lincoln, including the aisles, was about 65 ft. for the choir,⁵ and 66 ft. 5 in. for the nave. This again was greater than the scale of Bernay (choir, 58 ft. 6 in.; nave, 62 ft. 4 in.), Mont-Saint-Michel (nave, 57 ft. 9 in.), Montivilliers (choir, 57 ft. 6 in.), Saint-Nicolas, Caen (about 60 ft.), Saint-Georges-de-Boscherville (choir, 63 ft.), or Lessay (choir, 56 ft. 9 in.); but it was much the same as Jumièges (nave, 66 ft. 6 in.), and St. Augustine, Canterbury (choir crypt, 66 ft. 3 in.), though less than Saint-Étienne, Caen (nave, 73 ft. 6 in.).

¹ In the *Archaeological Journal*, liii. 10, I stated (following the published plans) that the choir aisles of Bernay finished square, both externally and internally. This is a mistake. In August, 1910, I had the pleasure of collaborating with M. le Chanoine Porée in the excavation of the end of the south choir aisle, which was found to be apsidal both externally and internally. My plan will be published in a forthcoming number of the *Bulletin Monumental*.

² Plans of all these east ends (except, of course, Lincoln) are illustrated in my paper in the *Archaeological Journal*, liii. 17, pl. iii. I may take this opportunity of correcting another mistake in this paper. The plans of Cerisy-la-Forêt and Lessay show the ends of the choir aisles as they now exist, but there can be no doubt that both have been altered from their original form, which was apsidal internally.

³ This slight excess of the width of the choir over that of the transept and nave was probably due to something in the architectural disposition of the side walls of the choir. At Cerisy the choir is 2 ft. wider than the nave, but this is due to the arcaded treatment of the side walls of the choir (see *Congrès de Caen*, pl. opp. p. 566). The remains at Lincoln, however, do not suggest this particular arrangement.

⁴ St. Albans also had a width of about 31 ft.

⁵ This is based on the ascertained width of the north choir aisle.

Cerisy (nave, 72 ft. 2 in.), or Canterbury Cathedral (72 ft.¹). Some comparisons of other dimensions are added below.

In working out the plan of Lincoln from what has been found, I have taken the standard thickness of wall as 4 ft. 9 in. This is the thickness of the north wall of the north transept. The wall of the north choir aisle is 4 ft. 8½ in. thick, and the width of the pilaster buttress next its eastern angle is 4 ft. 10 in. The width of the pilaster buttress next the eastern angle of the north wall of the north transept is 4 ft. 8 in., and the thickness (north to south) of the pier which supported the gallery of the north transept is from 4 ft. 6½ in. to 4 ft. 7½ in. We shall see, too, that this thickness is confirmed for the piers of the nave arcade by the thickness of the continuous foundation wall which connects the southern piers of the crossing. The thickness (north to south) of the nave piers of Saint-Étienne, Caen, is 4 ft. 8-9 in.

I will now begin the description of the reconstituted plan at its east end. The contraction of the width of the choir to that of the apse was effected by a single shaft on each side, which would receive an arch of a single order, the soffit of which was extended eastward as a narrow strip of barrel vault to an arch of two orders received by two shafts on each side at the opening of the apse itself, which latter would be covered with a semi-dome.² This is precisely the arrangement which still exists complete at Saint-Nicolas, Caen,³ and Saint-Georges-de-Boscherville,⁴ both of which retain their original groined vaults over the choir itself.⁵ Cerisy⁶ and Montivilliers are the same, except that they have only two single shafts, widely spaced in the same fashion, and at Lessay the apse opens from the choir by an arch of two orders, each received by a single shaft.

At Lincoln, the semicircular curve of the apse was struck from a centre on the line of the external face of the east end of the choir aisles. The apse itself was divided into five bays, as at Montivilliers, Saint-Nicolas, Caen, Cerisy, Lessay, and Saint-Georges-de-Boscherville.⁷ The bays seem to have been

¹ According to Professor Willis (*op. cit.*, p. 65).

² The choir roof would doubtless finish eastward with a gable over the arch opening into the apse, and the roof of the apse itself would abut against this gable at a lower level, as at Cerisy, Lessay, and Saint-Georges-de-Boscherville.

³ Pugin and Le Keux, *Specimens of the Architectural Antiquities of Normandy* (London, 1827), pls. xviii, xix.

⁴ A. Besnard, *op. cit.*, p. 58 (coupe longitudinale).

⁵ At Saint-Georges-de-Boscherville the apse is covered with a ribbed semi-dome.

⁶ At Cerisy there is a second shaft to the west, but this receives the arch of the triforium arcade of the straight bays of the choir (*Congrès de Caen*, elevation opp. p. 566).

⁷ So also at St. Albans (according to Buckler's plan) and Peterborough. So also in the ambulatory plans of Winchester and Norwich.

divided equally, centre to centre, from the external face of the east end of the choir aisles.¹ The thickness of the wall of the apse (7 ft. 4 in.) indicates that the wall was probably arcaded externally between the buttresses, and that it was arcaded internally over the lower windows with a single arch in each bay,² carrying a clearstory with a wall-passage, as at Saint-Nicolas, Caen,³ and Saint-Georges-de-Boscherville,⁴ and, as regards the internal arcade, at Cerisy⁵ and (in a less marked degree) at Lessay.

The choir was about 41 ft. in length,⁶ from the eastern side of the eastern piers of the crossing to the western shaft of the opening into the apse. The remaining foundation of a wall-shaft at u, j (pl. LXXV) proves that this length was divided into three bays. Two bays was the usual number in the earlier churches, as in the later churches, in Normandy itself—as at Bernay, Jumièges, Saint-Nicolas, Caen, Cerisy, Lessay, Saint-Georges-de-Boscherville, and in the Confessor's, Westminster. The choir of Montivilliers alone, like Lincoln, had three bays, though Bouet describes some indications which led him to believe that the choir of Saint-Étienne, Caen, had three bays.⁷ The choir of Lincoln, therefore, was an example of the greatest length (as regards number of bays) then adopted in Normandy, so far as we know, though it was soon exceeded by the four bays of the choirs of St. Albans, Durham, and Peterborough, and of the ambulatory plans of Winchester and Norwich—examples of the great expansion of plan which is so characteristic of the greater churches built in England after the Conquest.

If the width of the eastern bay of the choir, as determined by the existing remains, be repeated for the middle bay, the centre of the second wall-shaft is precisely in line with the centre of the wall of the transept aisle. The westernmost bay of the choir, next the crossing, was about 2 ft. wider than the two other bays, its width being governed by the width of the transept aisle.

The existing foundations at u, j, and m (pl. LXXV) indicate that the bays of the choir were divided by wall-shafts, which probably consisted of a broad

¹ The apse of Cerisy seems to have been set out in this manner.

² The standard thickness of 4 ft. 9 in., the depth of an external wall-arcade, and the depth of the internal arcade of Cerisy, make up the actual foundation thickness of 7 ft. 4 in. of the Lincoln apse.

³ Pugin and Le Keux, *op. cit.*, pls. xviii, xix.

⁴ A. Besnard, *op. cit.*, pls. opp. pp. 58 and 66.

⁵ Photograph in *Congrès de Caen*, opp. p. 570.

⁶ This is about 1 ft. more than the length of the choir of Cerisy, which has only two bays, the bay-width at Lincoln being much less.

⁷ G. Bouet, *op. cit.*, p. 18. The place indicated is now inaccessible without removing the roof covering, but Bouet's record of facts (from which it is sometimes necessary to distinguish his theories) is so accurate in respect of this church that his statement may be accepted for the present, in place of the current surmise that the choir of Saint-Étienne was only two bays in length.

pilaster with a half-shaft on its face, as in the choirs of Bernay, Jumièges, and Westminster, and to the alternate piers of the nave of Saint-Étienne, Caen. These wall-shafts of the Norman school have often been explained either as simply decorative, or as intended to support the tie-beams of the roof,¹ but in my view the origin of the idea must be connected with the intention to provide a support for an arch of some kind, and such shafts actually receive the transverse arches of original groined vaults in the choirs of Saint-Nicolas, Caen, and Saint-Georges-de-Boscherville.² It is more than probable that the choir of Lincoln was either actually vaulted in this manner, or at any rate that it was intended to be.

The existing remains are consistent with the supposition that the choir was separated from the aisles, not by an arcade, but by solid walls, as at Cerisy and St. Albans, and probably at Westminster.³ This, however, is not absolutely certain, for both faces of the foundation wall found between the south-east and south-west piers of the crossing (at j', pl. LXXV) are also of axed ashlar, and obviously this wall cannot have been carried above the floor level.

The choir aisles extended as far eastward as the springing of the great apse, and were finished square externally, and with apses of a little less than a semi-circle internally. The square external face is exactly in line with the centre of the curve of the great apse, and the springing of the internal apse is in line with the westernmost recession from the choir into the great apse. The square set-in from which the actual curve of the internal apse springs indicates a shaft on either side to receive the arch opening into the apse. At the east end of the lateral wall is a pilaster buttress of double projection, and on the east face of this angle there was probably a pilaster buttress of single projection.⁴ Assuming the standard thickness of 4 ft. 9 in. for the choir wall, the internal width of the choir aisle was about 13 ft.

The transept does not show the great development of length exemplified but little later at Winchester, and followed in the later great English churches. From the remains of the north arm, the extreme internal length works out to 122 ft. 9 in., which corresponds with that of the larger of our Normandy examples, and is almost exactly the length of the transept of Jumièges.⁵ At Bernay the

¹ This explanation is favoured by many French archaeologists. See, for example, R. Martin du Gard, *L'abbaye de Jumièges*, p. 109 seq. Cf. R. de Lasteyrie, *L'église de Saint-Philbert-de-Grandlieu* (*Mémoires de l'Académie des Inscriptions et Belles-Lettres*, xxxviii), p. 69.

² There is some evidence that the builders of the nave of Saint-Étienne, Caen, thought of a groined vault over the double bay, though the intention was abandoned.

³ *Archaeologia*, lxii. 98.

⁴ So at Saint-Nicolas, Caen.

⁵ Mr. Arthur G. Wallace gives me the internal length of the transept of Jumièges as 123 ft. 1 in.

length is 104 ft. 6 in.; at Sainte-Trinité and Saint-Nicolas, Caen, and at Lessay it does not reach 100 ft.; while at Saint-Georges-de-Boscherville it is only 103 ft. At Cerisy the length is much the same as at Lincoln; at Saint-Étienne, Caen, it is 124 ft. 6 in.;¹ at Canterbury (according to Professor Willis²) about 127 ft.; and at Mont-Saint-Michel 128 ft. According to my plan, the internal length of the north transept of Lincoln, to the north side of the crossing, works out to 42 ft., which is 1 ft. more than the length of the choir to the westernmost break of the opening into the apse.³

The northern end of the north transept was divided externally into two bays by a central pilaster buttress of double projection, this arrangement being dictated by the internal gallery and its vaults. The same division of the transept end by a central buttress is found at Jumièges, Mont-Saint-Michel, Saint-Étienne, Sainte-Trinité, and Saint-Nicolas, Caen, Lessay, and Saint-Georges-de-Boscherville; as also at Winchester, Ely, St. Albans, Chichester, Romsey, and Southwell. A small point in the plan of these buttresses is worth notice: the projection of the inner pilaster, next the wall, is less than that of the outer pilaster, and this is also the case in the buttresses at the north end of the north transept of Saint-Étienne, Caen.

The great square projection at the north-west angle of the north transept, to enclose the staircase, is unusual, for the stair in this position is generally included in the thickness of the wall reinforced by pilaster buttresses on each side of the angle.

One of the most interesting points in the transept plan of Lincoln is the disposition of its eastern side. All the Normandy plans which I have quoted as typical show a single apsidal chapel on the east side of each arm. At Lincoln this chapel takes the form of a rectangular aisle. It retains, however, something of the character of the apsidal plan, for its north end stops 4 ft. 6 in. (internally) short of the north end of the transept itself. The fact that the north jamb of the opening from the transept to the aisle (p', pl. LXXV) is in line with the inside of the north wall of the aisle indicates that there was probably a wide-soffited arch here,⁴ with an inner order received by a single shaft, as to the corresponding opening at Saint-Étienne, Caen.⁵ The aisle itself was about 13 ft. in width in-

¹ Professor Willis (*op. cit.*, 65) gives the transept length as 127 ft. As this did not agree with my own measurements (which were not taken specially for this purpose), M. Ferdinand Huard, the Caen architect, has very kindly taken this and some other measurements of Saint-Étienne purposely for me.

² *Op. cit.*, 65.

³ At Cerisy (according to the plan in Ruprich-Robert, *L'architecture normande*, pl. liv, fig. 7) the lengths of the transept arms are about the same as the length of the choir to the corresponding point.

⁴ This arch would, of course, be immediately under the vault of the gallery.

⁵ At Caen this opening is 14 ft. 9 in. wide; at Lincoln it is 15 ft. 5 in. wide.

ternally, which is also the width of the choir aisle. My plan shows a solid wall between the south end of the aisle and the choir aisle, as in the plans with transept apses, but nothing was found to indicate whether there was a solid wall or an arched opening here.¹

Aisles on each side of the transept still exist in the church of Saint-Remi, Reims, where the transept was begun about 1039,² and, according to the investigations of M. Lefèvre-Pontalis, they were part of the plan of the cathedral of Orléans as built after a fire of 989.³ The aisles on each side of the transept are found at Winchester and Ely, and on the east side only at Durham and Peterborough, but, so far as we know at present, Lincoln is the earliest example of an aisled transept in the Norman school.

The ground story of the transept was covered by the great gallery which is so characteristic of the Norman churches.⁴ The plan, as proved by what has been found, shows marked analogies with that of Saint-Étienne, Caen, but, owing to the narrower span of the transept at Lincoln, and its greater projection beyond the walls of the aisles, the bays of the gallery vault were much more oblong than at Caen.⁵ The central pier was considerably larger than that at Caen, though its component members were probably similar. The ashlar-faced foundation wall (J', pl. LXXV) found between the southern piers of the crossing may possibly indicate (though this is not absolutely certain) that the gallery extended over the whole area of each arm, up to the north and south piers of the crossing, as at Jumièges

¹ The continuation of the inner face of the choir aisle wall at q in relation to the angle of the pier at the west end of this aisle, found at f' (plate LXXV), indicates a projection for this pier which is not enough for the three shafts which are found in this position, and also on the backs of the crossing piers, at Saint-Étienne, Caen. Following this indication, I have shown all these piers (plate LXXVII) with two shafts only, without the central shaft.

² L. Demaison, *Date de l'église de Saint-Remi de Reims* in *Travaux de l'Académie de Reims*, lxxi. (1883) 298-308.

³ E. Lefèvre-Pontalis and E. Jarry, *La cathédrale romane d'Orléans*, in the *Bulletin Monumental*, lxxiii. 372.

⁴ Jumièges, Bayeux, Saint-Étienne and Saint-Nicolas, Caen, Cerisy, Saint-Georges-de-Boscher-ville, Canterbury, Winchester, and Ely.

⁵ The plan can only be interpreted in this manner, though it may be objected that the vaulting of such excessively oblong bays would present serious difficulty. The difficulty was met in many of these early unribbed vaults by the employment of a low segmental curve for the arches of longer span, while the shorter spans were covered by semicircular arches, perhaps stilted. The segmental curve for the arch from north to south under this gallery at Lincoln, developed in this manner, would indeed be very low, but it would be very little lower than that of some of the arches in the central crypt of Winchester Cathedral, and not so low as the curve of the upper part of the outer arch between the ambulatory and the eastern chapel of this crypt; and the curve would be very similar to that of the diagonal ribs of the vaults of the choir aisles of Durham (for these, see *Journal of the Royal Institute of British Architects*, 3rd ser., vi. 298, fig. 10).

and originally at Bayeux, and my plan suggests cylindrical piers¹ to receive the arcade under the front of the gallery between the crossing piers. The shaft on the inner face of the gallery pier *g'* (pl. LXXV) seems to indicate an extension of the gallery vault towards the crossing, but this shaft also occurs at Saint-Étienne, Caen, where the gallery finishes in line with the aisle walls, and the shaft runs up the front of the gallery and carries nothing. The presence of this shaft at Caen, however, would be readily explained if the original intention there was to extend the gallery up to the crossing,² which may very well have been the case, considering the earlier examples of Jumièges, and of Odo's cathedral of Bayeux which was dedicated in 1077.³ On the whole, the gallery over the whole transept arm would seem to be most probable for Lincoln.⁴

The thickness of the foundation wall found at *j'* (pl. LXXV) between the southern piers of the crossing, which is 5 ft. 1½ in., compared with the standard thickness of 4 ft. 9 in., suggests that the crossing piers were a little thicker than the piers of the nave arcades, and this is precisely the case at Saint-Étienne, Caen.⁵

The nave of Lincoln was ten bays in length, excluding the bay between the western towers. It is, therefore, an example of that expansion of plan of which I have already spoken. The nave of Bernay (originally) had seven bays, as later at Mont-Saint-Michel, Saint Nicolas, Caen, and Lessay. The naves of Jumièges, Saint-Étienne, Caen, Cerisy, and Saint-Georges-de-Boscherville have eight bays, and although Sainte-Trinité, Caen, has a nave of nine bays, the bays are of less width and the total length less than at Saint-Étienne. Lincoln, however, considerably exceeded Saint-Étienne in the length of its nave, as in the number of bays.⁶

The internal width of the aisles of the nave was about 14 ft. 1 in., i. e. about 1 ft. more than the width of the aisles of the choir and transept.

¹ As at Saint-Georges-de-Boscherville. At Winchester the cylindrical piers have a pilaster and half-shaft on the back to receive the aisle vault. In both these cases, the gallery only extends over the extreme bay of each arm of the transept.

² The shaft which rises from the abacus of the gallery pier at Winchester, and stops abruptly at the gallery floor, cannot be explained in this manner, and it would seem to be merely decorative.

³ *Congrès de Caen*, pp. 145 and 154.

⁴ Mr. C. R. Peers has found evidence that at Christchurch (Hampshire) the transept galleries extended up to the crossing piers. His account of this church will be found in the forthcoming vol. v for Hampshire in the *Victoria County History*.

⁵ The thickness of the wall at the arcade piers of the nave of Saint-Étienne, Caen, is (as stated above) 4 ft. 8-9 in., and the thickness at the crossing piers is about 5 ft. 2 in.

⁶ The total internal length of eleventh-century Lincoln, from the inner face of the apse to the inside of the west wall (actually measured to the back of the fourteenth-century wall-arcade on the west wall), was about 310 ft. The total external length, from the outer face of the apse to the outer face of the west front, was about 334 ft. 4 in.

As to the spacing of the nave bays, from my setting out it would seem that the eastern bay, next the crossing, was narrower than the others¹ by something less than a foot. At Saint-Étienne, Caen, the width of the eastern bay is about 1 ft. less than that of the second bay. The reason in both cases would be the same, viz. that in setting out sufficient length was not allowed for the greater width of the crossing piers and eastern responds. At Lincoln the second bay also is 5 in. narrower than the succeeding bays westward, but this arises from the length having been set out along the aisle, where the wall-pier between the first and second bays is of less width than the others westward, for the interspaces between these wall-piers are equal to within an inch in the second and third bays.

The width of the easternmost wall-pier of the north aisle suggests a pilaster with a half-shaft on its face, as in the choir. Westward the wall-piers are considerably wider.² Their width, 4 ft. 3 in., and projection, 2 ft., exactly suit such a pier as those of the nave aisles of Saint-Étienne, Caen, which consist of a half-shaft on the face of a pilaster, which receives the transverse arch, and a half-shaft on either side which receives the projecting springing of the groin, of the aisle vault. This gives us also the form of the piers of the main arcades on the side next the aisle. The form of the remainder of the pier is suggested by the two single stones of shafts which were found re-used in the foundation at D'', near the western respond of the present north arcade of the nave. The diameters of these two shafts are almost precisely those of the larger and smaller shafts which receive the arcade arches in the nave piers of Saint-Étienne, Caen, and we may therefore conclude that the Lincoln piers had the same plan.³

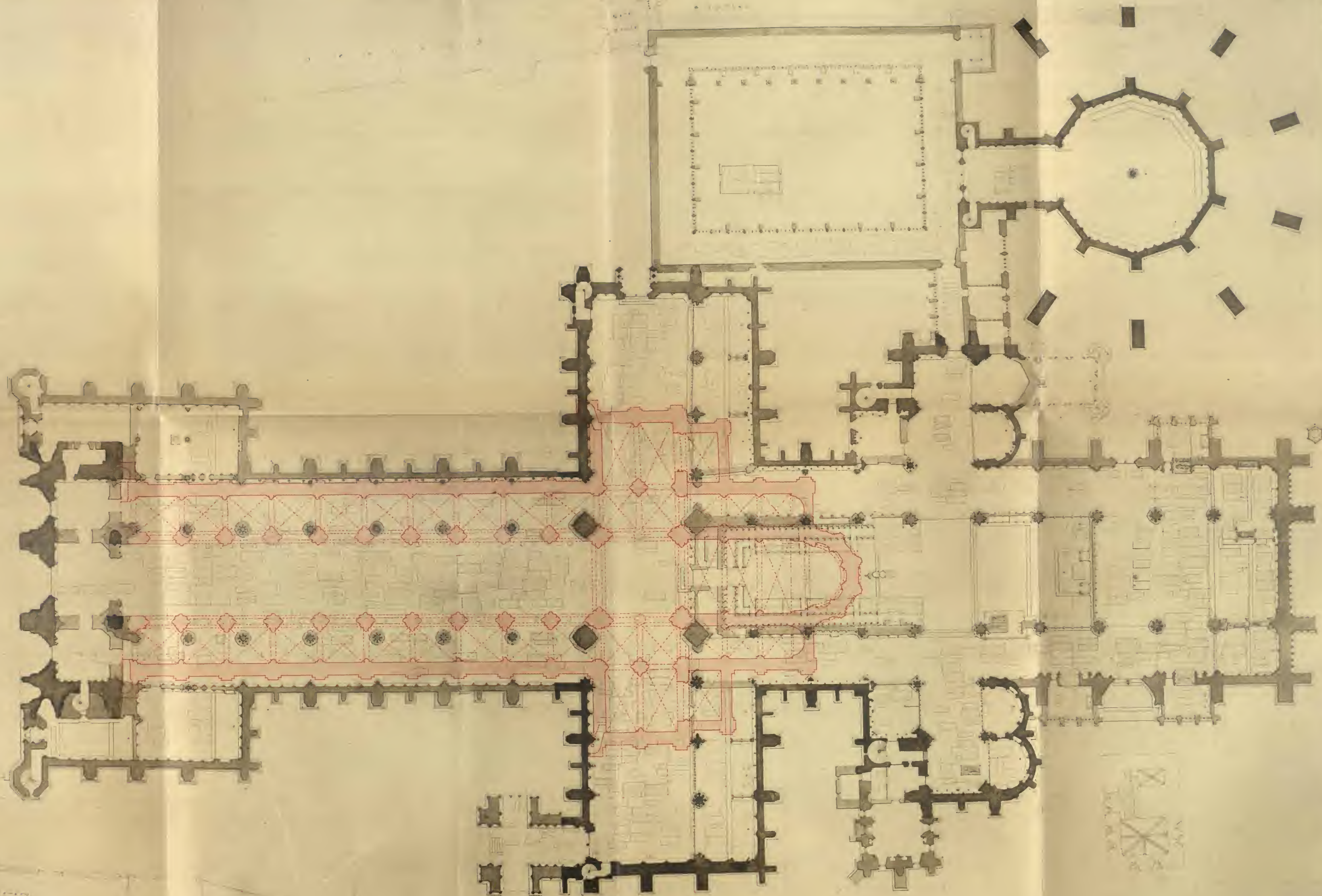
The remains found in the north aisle give a bay-width of 18 ft. 4 in., from centre to centre of piers, for the third bay from the crossing, and of 18 ft. 4½ in. for the eighth bay; the intervening length (not excavated) works out to an average of 18 ft. 5½ in. each for the fourth, fifth, sixth, and seventh bays. In the ninth bay (second from west end) on the north side, the interspace between the wall-piers is 12 ft. 10½ in., which, if the wall-pier to the west was of the same width as those eastward, would give a width, centre to centre, of 17 ft. 1½ in., and may indicate that the width of the two western bays was less than that of the other bays eastward.⁴ On the other hand, on the south side the side of the wall-pier w' (pl.

¹ i.e. the third to the eighth bay, inclusive.

² This point, one bay west of the crossing, is a likely place for a slight change of this kind.

³ They are so drawn on my plan, except as regards the wall-shafts next the nave, which at Caen are alternately simple half-shafts, and half-shafts on the face of pilasters. For the plan of the Caen piers, see *Journal of the Royal Institute of British Architects*, 3rd ser., vi. 291, fig. 2, iv.

⁴ The two westernmost bays of the present nave are narrower than those eastward, but the difference is very much greater than that indicated by the second bay on the north side for the eleventh-century work.



PLAN OF LINCOLN CATHEDRAL BY E. J. WILLSON, F.S.A.
 To which is added in red a plan of the first church as developed from the existing remains shown on
 plates LXXV and LXXVI, by John Bilson, F.S.A.
 Published by the Society of Antiquaries of London, 1911



LXXVI) seems to be about 1 ft. 2 in. further west than the side of the wall-pier *u'* on the north aisle wall, which seems to indicate that the second bay from the west on the south side was of the same width as the other bays eastward. Nothing remains, either in the work which has survived above floor-level, or in what was found in the excavations, to indicate the precise width of the western bay on either side, but it may be noted that the continuation of the normal spacing of the nave bays through the two western bays would extend almost exactly as far west as the line of the back of the thirteenth-century wall-arcades on the west side of the Morning Chapel and of the Consistory Court respectively. How the eastern sides of the towers were finished towards the nave aisles, we can only guess now, for all traces of the original plan have been obliterated by the successive alterations which this part of the church has undergone. It would seem to be certain, however, that there was originally some massive thickening of the tower works on this side, corresponding to some extent with those on their west faces, and on their north and south faces respectively. This is indicated by the masses of masonry on the inner (or nave) sides of the two western respond piers of the present nave arcades, and the much larger masses between the west side of the Morning Chapel and of the Consistory Court and the forework on the north face of the northern tower, and that on the south face of the southern tower; and some considerable buttressing on the east side of these great towers would in any case have to be provided. The west ends of the aisles as shown on my plan are pure conjecture, and are merely intended to illustrate a possible arrangement.¹ The centre line of the larger shafts to the suggested recesses at the ends of the aisles is set out on the basis of the continuation westward of the normal spacing of the nave bays. The staircases suggested where the west ends of the aisle walls abut against the towers occur in this position at Saint-Étienne, Caen, and at Bayeux.²

A study of the western part of the eleventh-century church which still remains above ground, which cannot be attempted here, would show how much can be learned from it of the architecture of the nave of which it formed so noble a termination. One interesting point, however, may be noticed. The outer faces of the main walls of the nave are indicated on the west front by the lines of the southern jamb of the great northern lateral recess, and by the northern jamb of the corresponding southern recess.³

¹ I have been obliged to ignore the foundations found at *y'*, *z'*, of which I frankly confess I cannot offer any satisfactory explanation.

² See the plans in Pugin and Le Keux, *op. cit.*, pls. vii and xxiv.

³ The exact width between the lines of these two jambs on the west front is 38 ft. 7½ in. The width of the nave, as indicated by the existing remains on either side of the bay between the towers,

The plan of Bishop Remi's church, as worked out from the remains which have been found, is an admirable illustration of the logical precision, clearly defined structural organization, and feeling for monumental form which characterize the best work of the Norman school. It conforms very closely to the 'type' of the contemporary works of the continental school of Normandy, much more closely than do most of the great churches built in England after the Norman Conquest. It shows some indications, though as yet but slight, of the great expansion of scale which is illustrated in the nearly contemporary church of Winchester, and it is an important landmark between the plans of the earlier Norman churches and such a completely developed plan as that of Durham. And its western work stands almost alone as a magnificently original piece of monumental building, a speaking witness of the powerful architectural expression of a masterful race.

was 28 ft. 9 in.; adding to this two walls of the assumed thickness of 4 ft. 9 in. each, we have a total width to the outside of the nave walls of 38 ft. 3 in

XXVI.—*A Late-Celtic and Romano-British Cave-dwelling at Wookey-Hole, near Wells, Somerset.* By H. E. BALCH, Esq., and R. D. R. TROUP, Esq.

Read 23rd March, 1911.

THE great cavern of Wookey-Hole is situated two miles to the north-west of the city of Wells, in the centre of Somerset, and immediately adjacent to the thriving village which has taken the name of the cavern, and has depended for its prosperity on the existence of the copious and usually pellucid stream, which here bursts forth from Mendip's hidden reservoirs. This is the source of the Axe, which winds its way through the lower lands, and after uniting with the sister stream of Cheddar, flows into the sea near Weston-super-mare. From Wookey-Hole the southern slope of Mendip rises in an unbroken sweep till it reaches a thousand feet above the sea, commanding a magnificent view to the east, south, and west. It is not a limestone cave in the ordinary sense of the word, since every known cavity in the immediate vicinity is not in the Carboniferous Limestone, but in the Dolomitic Conglomerate, which here attains enormous thickness. To the north, the great mass of Carboniferous Limestone, receiving the water of innumerable springs from the Old Red Sandstone and Shales and from a generous rainfall, engulfs it in a countless number of swallets, many of which are insignificant, whilst some of the larger have been opened by our exploring parties during the past few years, and followed through unimagined beauties to profound depths.

It seems that a pre-Triassic cave-gorge has become filled up entirely with débris, thus blocking an ancient outlet; and, on subsequent re-elevation, the stream from the Limestone has worn its way through the impeding mass, and is again in course of forming a cavern ravine along practically the same line. The plan and projected section (fig. 1) give an idea of the form and extent of the cavern generally, so far as we have yet found passable ways. It consists principally of three great chambers on the river level, whilst, at the point indicated at the north end, there is a fourth not accessible under ordinary conditions. Above is a series of passages and chambers, representing ancient stream-levels, and affording abundant evidences of river action. Though of course these are merged at certain points, there are five definite levels of outlet readily traceable, with an obvious increase in size as they descend.

Our knowledge of most of the higher levels of the cavern is limited to that

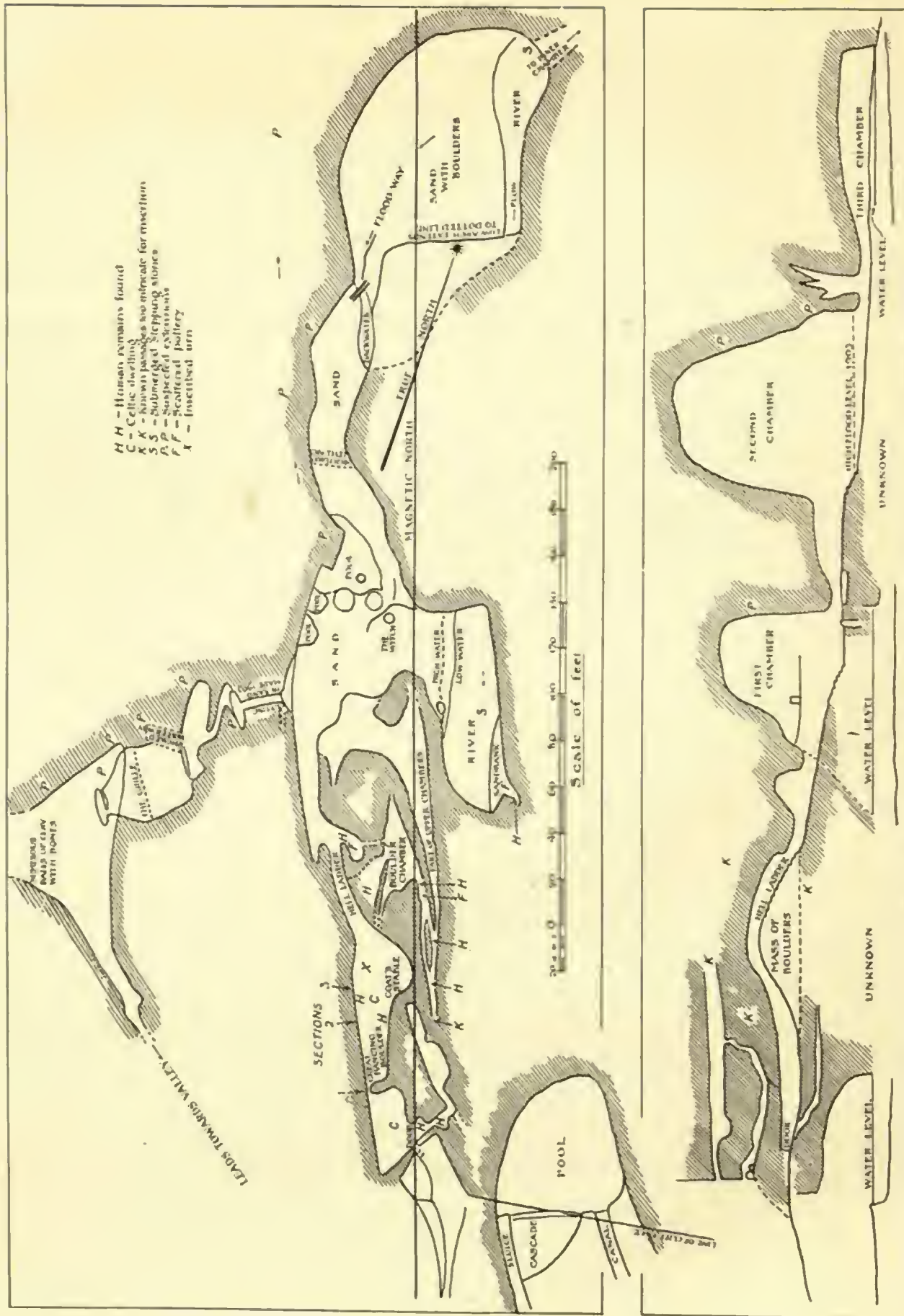


Fig. 1. Wookey-Hole Cavern, Plan and Section, 1910.

part lying between the entrance and the first great chamber, and efforts to trace them beyond this point have hitherto taken us away from the present line of the river. In the beautiful stalactite chambers found in 1902, we have discovered a very early water channel running in from the north-west, and on its floor a deposit of upwards of a foot of clean coarse sand, over which lies a thick pavement of hard and compact stalagmite. Through this we hope with great labour to break a way, but the process is a lengthy one, and the necessity for safeguarding the stalactite prevents anything like violent methods of removal.

Everywhere, from the highest to the lowest levels in the cavern, there are deposits of sand of varying degrees of fineness. In the river chambers each flood picks up a certain proportion of the previous deposit, and precipitates another in its place. The existence on the hills at Priddy, three miles away, of extensive workings for lead, has had no inconsiderable effect upon the amount of sediment borne down by the river. This cause has been in operation for at least two thousand years, as there is abundant evidence that, in Celtic and Roman times, washing for lead was carried on wherever water was available on the Mendips above. Whatever method of washing has been in operation through all these centuries, in every case a considerable amount of the finer material has passed away to the swallets, sometimes entirely choking and concealing them, as was shown at St. Cuthbert's Lead Works in 1908, when the removal of seventeen feet of deposit exposed an original swallet in the bottom of the valley. Near the base of this deposit, too, was found in the same year the skeleton of a woman, with plaited tresses of hair intact, and with it were four decorated glass beads of Celtic type. The beads were sent to Prof. Boyd Dawkins by the company's officials in London, to whom they were returned, and are now, in consequence of the closing of the works, in danger of being lost to sight. A similar bead occurred in the Celtic deposit at Wookey-Hole, where also have been found from time to time traces of crude open-hearth smelting, such as was then in vogue on the Mendips.

When we consider the abundance of remains of Roman times in the county, and the existence of camps and earthworks which were certainly pre-Roman, the wonder is not that plentiful remains have been found in the cavern, but rather that they have escaped the attention of archaeologists for so long. On every side abound these evidences: at Masbury, Dolberrow, Banwell, and elsewhere, there are British camps, most of which were later used by the Romans. At Shepton Mallet, and at Cheddar, there have been found many relics of domestic life of the Roman period, whilst at Priddy and at Charterhouse, where extensive mining took place, in recent years numerous ornaments, utensils, coins, and occasional pigs of lead have been found. Our superficial deposits have yielded post-Roman material. Beneath, but near the surface, follows the Roman

layer, whence without a break we pass into the Celtic debris. Little more than a stone's throw from the cave, neolithic remains abound,¹ while across the valley is the famous Hyaena Den, excavated and described by Prof. Boyd Dawkins, where abundant proofs of palaeolithic occupation were laid bare.

To any one standing in the bottom of the valley, the entrance to the cavern is not at first apparent, and before the cutting of the present path, the ascent to the elevated entrance must have presented formidable obstacles, and rendered it impregnable if held by resolute defenders. From above, and from either side, the cavern was still less approachable, and it is clear that with a store of food in the cavern, and with an unfailing water supply, this retreat must have been the chief stronghold of the district. Except for a superficial deposit of soil, leaves, and rubbish, the cavern is in the same condition as when it was vacated about A.D. 390. Not a rock of any importance has fallen, not one has been removed from the floor. Those upon which we now rest our tools were evidently used for a similar purpose two thousand years ago. Our researches indicate that the occupied portion extended for a distance of 90 ft. inwards from the present doorway, and of this little more than 30 ft. was lit by daylight. Beyond the inhabited part, however, occurs a considerable quantity of broken pottery, with coins. This is at the bottom of 'Hell ladder', a distance of 150 ft. from the entrance, and we have also many fragments from amongst the boulders lying to the east of this point.

The inhabited part was a roomy passage, with an average width of 10 ft., and singularly free from drip; from the general absence of stalagmite it is clear that this has always been the case, and the place was favoured in other ways as a habitation for man. One of its most striking features is the singular configuration of the upper passages, which enabled the smoke to escape without causing inconvenience. This was due to the fact that the upper passages, into which the smoke could readily pass, had each its independent outlet in the face of the cliff; thus circulation was set up, and, as our experiments show, the entrance gallery remained free from smoke. On several occasions with fires in the cave, we found that the atmosphere remained perfectly clear; and the smoke was seen pouring out from points high up above the entrance. The temperature of the cave, too, was far more equable than that without, affording cool shelter in summer, and comfortable warmth in winter. At a short distance from the entrance, there is never any variation, winter or summer, from a temperature of 50° F.

At this elevation above the river, there was no fear of sudden floods, even in the wettest weather; in fact, the inhabited part is remarkably dry after a very heavy rainfall. In only one limited portion have we found water-borne mud, and this occurred at the lowest part of the floor, and lay a foot in depth, directly upon

¹ The Report of the Wells Natural History and Archaeological Society for 1910 gives an account of these neolithic finds.

the Roman deposit, being crossed in its shallowest part, against the western wall, by three layers of stepping-stones. The accidental formation of this muddy pool may possibly have caused the abandonment of the cave, coming as it did quite in the centre of the living quarters. It is equally probable that the marauding bands which pillaged everywhere after the withdrawal of the Romans, were the sole cause of the abandonment. That there was a time in the remote past when

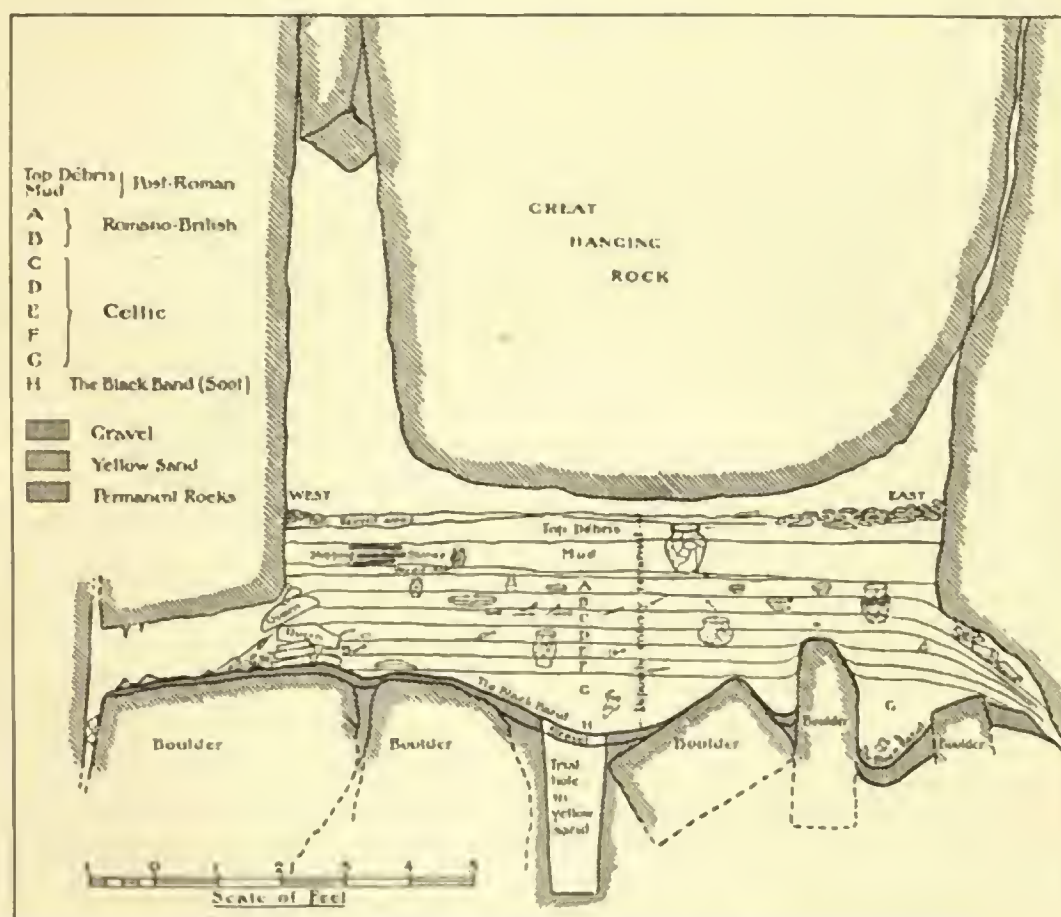


Fig. 2. Section across Celtic and Romano-British Deposit at 30 ft. from entrance.

the river floods reached even to this height, is manifest from the existence, beneath our excavations, of a considerable thickness of fine yellow sand, overlaid by a thin layer of black soot-like deposit, which soot follows every irregularity of the floor, rising even over boulders. It has been impossible to determine what lies below the sand (into which was sunk a trial hole, as shown in fig. 2), as we have had to deal with a great depth of material so as not to leave dangerous holes in the frequented passages, and we have therefore confined our work to the deposits lying above it.

With the ramifications of the passages which lead off from the main gallery,

the cavern appears to afford accommodation for unlimited storage against siege or famine, and without question it was put to such a purpose many times in the course of its chequered history. This may explain the existence in the remote passages of fragments of great vessels, which would be used to store foods, such for instance as grain, beans, peas, acorns, &c., all of which have occurred in our workings. The equable temperature of the place, and the comparatively dry atmosphere of the passages, must have facilitated such storage. Vast stores could have been accumulated and left unguarded, and yet have been practically safe from discovery by any chance trespasser. As will be seen later, we found in the course of our workings a key or latch-lifter, which may indicate that the entrance was protected by some kind of palisade, which would have added greatly to the strength of the defence.

One cannot but be struck by the enormous superiority in strength of this position when compared with the lake-villages, where the only protection was the surrounding water (which must have been passable to an enemy in time of severe frost) and the stockade. This is the obvious reason why the occupation of the lake-villages ceased when the Romans came, whilst that of the cavern persisted until the withdrawal of the legions, when the Cave people, unable longer to secure their crops and herds, followed their retreating Celtic relatives westwards into the fastnesses of Wales.

Before any systematic search began, we discovered human remains lying on the surface in a small passage immediately adjacent to the entrance, and running down steeply to the east inside the doorway. Here, at the base of a slope of débris, and 6 ft. below the level of the main passage, there lay a human jaw, the head of a femur, and some fragments of pottery. We then cut a section through what proved to be an accumulation of wood ashes, obviously refuse from occupation. There was no apparent stratification, as the whole had been precipitated down the slope as a talus, but there were clear indications that we had here remains of a long period, the close of which was Roman in character, as shown by the presence of Roman coins. We proceeded to prove the extent of the deposit by a series of small test holes, all of which without exception confirmed the importance of the find, and we further determined its extreme limits by search among the boulders in the more remote parts, before seeking authority to make a full exploration of the cave. Mr. W. S. Hodgkinson, with his invariable kindness, at once gave the necessary authority, and his tenant, Mr. George Adlam, with equal readiness, assisted us by every means in his power. We commenced work in the autumn of 1908 at the extreme inmost limit of the accumulation, intending to make a vertical cut from wall to wall of the cave so as to expose a complete section of the floor. We were surprised to find that the superficial material in the centre of the floor was only three inches in depth,

being largely composed of coal-ash, which had been laid from time to time by the tenant of the cave to improve the pathway. This formed a hard cake, and when it was removed we found that we had a depth reaching a maximum of six, but averaging three, inches of black material, consisting chiefly of pottery fragments, wood-ash, and earth, with various articles embedded. From the moment this was reached, the idea of laying bare a section was abandoned, as great boulders projected through the deposit. The intervening cavities were in many cases open, and contained, frequently at a considerable depth, detritus of various ages inextricably mingled, pieces of tobacco pipe sometimes lying alongside pottery of Roman age. Articles found under these conditions have been classed as indefinite, although in many cases their period is obvious. The floor itself

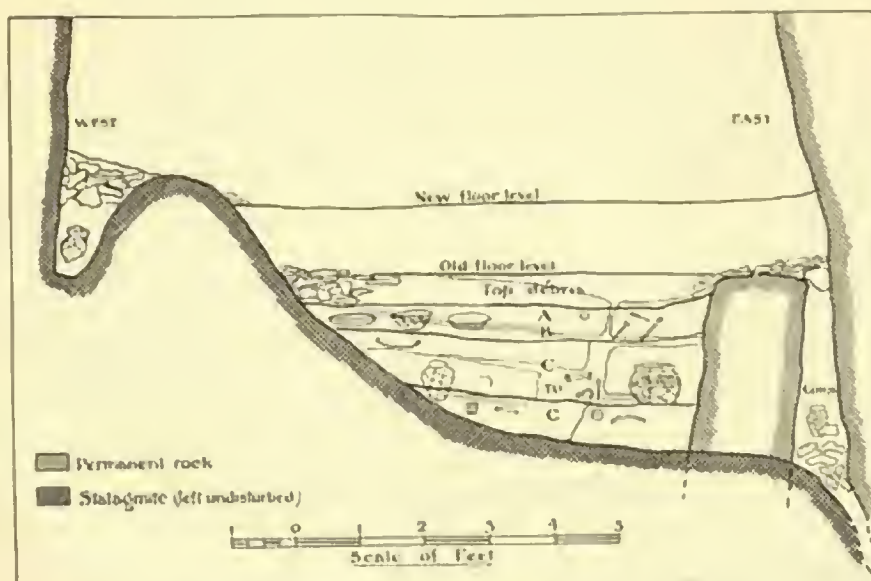


Fig. 3. Section across excavation at 60 ft. from entrance.

presented a fairly regular sequence, and we excavated it down to the stalagmite base which formed the original floor at 60 ft. from the doorway, this being the only spot in the dwelling which shows any stalagmite.

A diagram of the passage at this spot is shown in fig. 3, with the relative position of some of the finds. Of the further diagrams, fig. 4 shows the form of the place at 75 ft. from the entrance, and fig. 2 the point where exists the most perfect stratification yet found. We excavated a total depth of nearly four feet of accumulated material in cuts of three inches, till we came to the deep level marked G, in which remains occurred most sparsely. The top debris consisted of surface material blown, rolled, or dragged into the cave; beneath was a chocolate-coloured mud deposit, marking possibly some local wash-out of a fissure, and the formation of a pool. This contained only fragments of boiling-pot.

Beneath, and totalling only six inches, layers A and B represented the whole period of the Roman occupation of Britain. Here pottery and other remains abounded. In the diagram, which is to a certain extent projected, types of pottery are inserted in the various levels where they were found, and other articles are

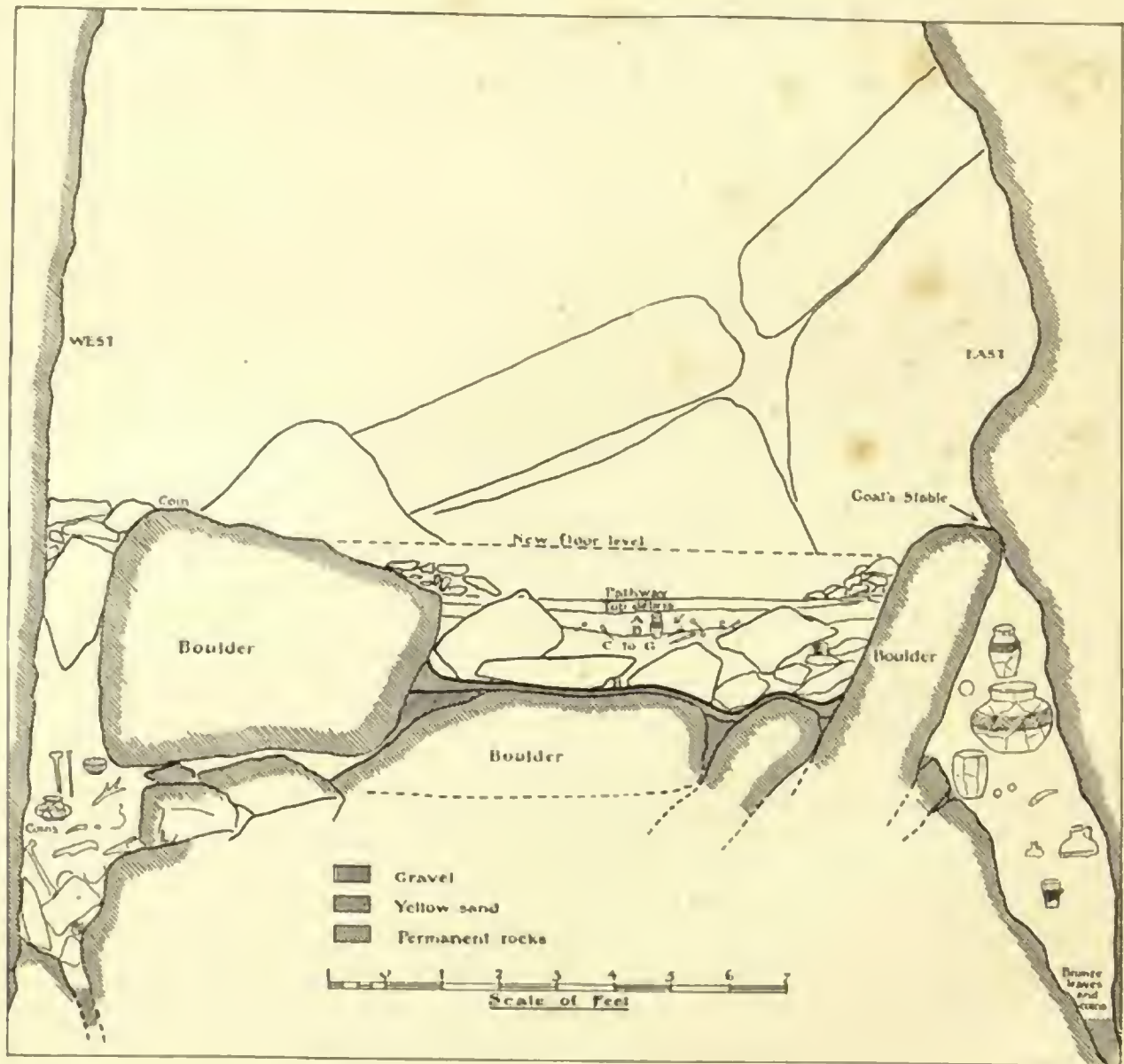


Fig. 4. Section across excavation 75 ft. from entrance.

similarly shown. A pair of large beehive querns are shown at the entrance of the small chamber on the left, in the position in which we found them. A detailed account of the finds is given in the succeeding pages. From first to last we have pursued the same method of investigation: limiting the excavation to a definite

line of deposit where such could be traced, and to a certain measurement where this was absent, we have removed as much earth as our box would hold to a raised board, upon which we have tipped it. Working principally with an acetylene lamp, we have then slowly searched through it with thin blades of wood, spreading each small portion on the board before us before discarding it. When we say that articles the size of small seeds, one-inch pins, and the like, have not escaped observation, it will be evident that we have obtained everything that the material contained. Our greatest difficulty has been the disposal of the refuse, which has hampered us at every turn. We have endeavoured to leave the place more accessible, and have for this purpose lowered the floor over a large area to the extent of several feet, raising it elsewhere to correspond. In the absence of dumping ground outside the cave, we have been compelled to contrive all sorts of tipping places, at the same time leaving no hideous disfigurements. Various expedients have had to be adopted to bridge over excavations in the pathway for visitors to the cave, and these have frequently doubled our work. It has been no uncommon experience to remove one or two small wedged stones in an apparently solid floor, thereby revealing a tempting fissure with loose earth and stones. Near the 'goat's stable', for instance, was a hole leading to a small chamber twelve feet below the level of the main gallery. This was first passed by Dr. E. A. Baker, and was subsequently searched by Mr. R. Balch; it yielded a spade and two bowls (the best preserved articles of wood yet discovered), two nearly complete urns, and several coins. Two other prolific but difficult fissures are seen in fig. 4.

It will be seen in fig. 2 that at the commencement of the Celtic period the inhabitants found the place in the form of a long and roomy passage or chamber, its floor consisting of coarse gravel with sand below, whilst great boulders projected here and there, forming in some cases convenient seats and tables. They found the entrance much overhung, providing a kind of natural ante-chamber open to the daylight and yet perfectly protected from the wind and rain. Further (fig. 3) they found a smooth floor of stalagmite sloping across the chamber, and passing across this they climbed over a mass of boulders with numberless interstices and hollows. Over the whole floor ran a thin layer of black sootlike material, a deposit which we think marks an earlier occupation, possibly corresponding with a similar though larger deposit found at Kent's Hole at Torquay, and proved to be of neolithic origin. It is evident that wood fires were continuously used from the first, probably never being allowed to go out, as throughout the lower layers an enormous deposit of grey ash occurs, with interspersed relics comparatively scarce. Great quantities of this ash gravitated into a cavity on the eastern side of the passage, forming one of our difficult slopes of detritus, and intermingling the deposits. The effect of this accumulation must

have been to level rapidly the irregularities of the floor, and to provide a much improved habitation, though many of the more distant fissures remained open to a much later date.

The abundance of iron nails, many of them clinched, suggests that even the earlier people used wood for domestic purposes. So far as the excavations have yet gone we have found no remains without accompanying objects of iron, and we therefore conclude that all our pottery and other finds, however crude, belong to the Early Iron Age. There are indications that iron smelting took place on the spot, as we have several specimens of hematite similar to that which occurs, and has been mined, little more than a mile from the cave. These occurred in levels D and F, whilst we also have a small lump of imperfectly smelted iron from level F, and a larger lump from level B. The condition of a large number of the articles of iron, more especially those of earlier date, indicates that the reduction was never very perfect, there being a kind of foliation which shows itself the more as oxidation advances. It would appear to have been hammered up from an imperfectly plastic condition. Some iron, however, was more probably imported into the cave in the form of currency-bars, of which we have portions



Fig. 5. Iron currency-bar, Wookey-Hole. 1.

of three distinct specimens. They appear to have been looked upon not merely as currency, but as worked-up iron which could be readily turned into articles of daily use. In support of this we have a portion of a bucket handle, attached by a rivet to the broken rim, the handle agreeing most exactly with the smaller of our currency-bars. We have submitted our specimens to Mr. Reginald A. Smith, of the British Museum, whose work upon the subject¹ is well known, and he is of opinion that the smaller bar (fig. 5) is a quarter-unit specimen, a denomination hitherto unknown. It is barely half an inch in width and $\frac{3}{4}$ in. in thickness, and separated into two portions in getting out, these being $5\frac{1}{2}$ and $5\frac{3}{8}$ ins. long, and weighing 530 and 510 grains respectively, which gives a total length of $10\frac{7}{8}$ in. and a weight of 1,040 grains or 67.519 grammes. The recognized unit being 4,770 grains or 309.74 grammes, this specimen is 152 grains short of true quarter standard, a difference frequently exceeded in known higher-value bars. A point of some importance in this specimen, however, is the fact that the line of fracture between the two portions is square, and the length of the two pieces equal, so that it is practically certain that some incision had been made before the bar was lost in the floor débris. The other specimens are the handle end

¹ *Proceedings*, xx. 179; xxii. 338.

of a unit currency-bar and the basal portion of a half-unit bar, weighing respectively 846 and 750 grains, which, when multiplied up to average length, give results agreeing with the known standard.

DESCRIPTION OF THE FINDS.

Iron Weapons and Tools. As at Glastonbury, weapons of offence and the chase do not occur in abundance at any level of the excavation. An iron dagger and bronze pommel found in association, but not necessarily belonging together, accompanied Celtic pottery, implements, and parts of a human skeleton in the fissure shown near the west wall in fig. 4. The weapon is 5 in. in length and $1\frac{1}{4}$ in breadth at its widest part, unusually well finished, and capable of being wrought to a fine edge on any of the many hone-stones found. A further portion, with tang and bearing a rude trefoil as decoration, was found hard by, and has been figured as part of this weapon (pl. LXXVIII, fig. 16). The bronze pommel is a solid, bell-shaped knob, the end of which sinks into a hollow, out of which the centre rises as a cone. It shows what is probably a portion of the iron tang embedded in the bronze. A 4 in. handle of a large dagger, or possibly sword, came from the lowest level G. It bears part of a wooden grip with two iron rivets, which prove the handle to have been $\frac{3}{4}$ in. in thickness and $1\frac{1}{4}$ in. wide. The termination of the wood is symmetrically finished. Considering that spears and arrows must have formed the principal weapons of the chase, we should expect to find them in abundance. The total number, however, which the excavation has yielded so far is one spear and the point of another, one javelin, and five arrows, all of iron. The first is a socketed spearhead from level G, $5\frac{1}{4}$ in. long, the socket being formed by folding, but leaving an open space at the base of the blade. The head is leaf-shaped, the apparent barb on the side being due to oxidation. From level C we have the point of a long spear, $3\frac{1}{4}$ in. long, and from D a large 6 in. socket of another. A smaller socket was probably that of a javelin. It was customary to use ferrules or counterpoises for the butt end of the spear-shafts; and three of these were approximately an inch across and an inch in depth. A barbed javelin from level F appears to have been socketed, but the socket is missing. Its point has been bent at right angles, probably through contact with a rock. Well-preserved leaf-shaped and socketed arrows, nearly 3 in. in length, were, like the javelin, bent through contact with some hard body. They were possibly placed on one side for repair. Two are from the Celtic level F. There was also an arrow-head of different type, $2\frac{1}{4}$ in. in length, with an entire socket merging into the head. This is of more solid form and not bent. An arrow-head of curious form from level D retains a portion of the wooden shaft, which appears to have some kind of spike embedded in it. A later form (pl. LXXVIII, fig. 12), from the Roman level B, has the socket entire, but, unlike the others, is barbed. A bill-hook, like that of the modern hedge-trimmer, is identical with several found at Glastonbury. It is 10 in. in length and massive, the folded socket leaving its upper end open, as in the case of the spear-head mentioned above. A mass of stalagmite forms a projection from the socket. The triangular chopping-knife (pl. LXXVIII, fig. 10) resembles the sacrificial knife carved on the sides of two altars found at Vindolana and Borcovicus on the Roman Wall. It is 10 in. long and has its point broken off; the socket is perfect, and

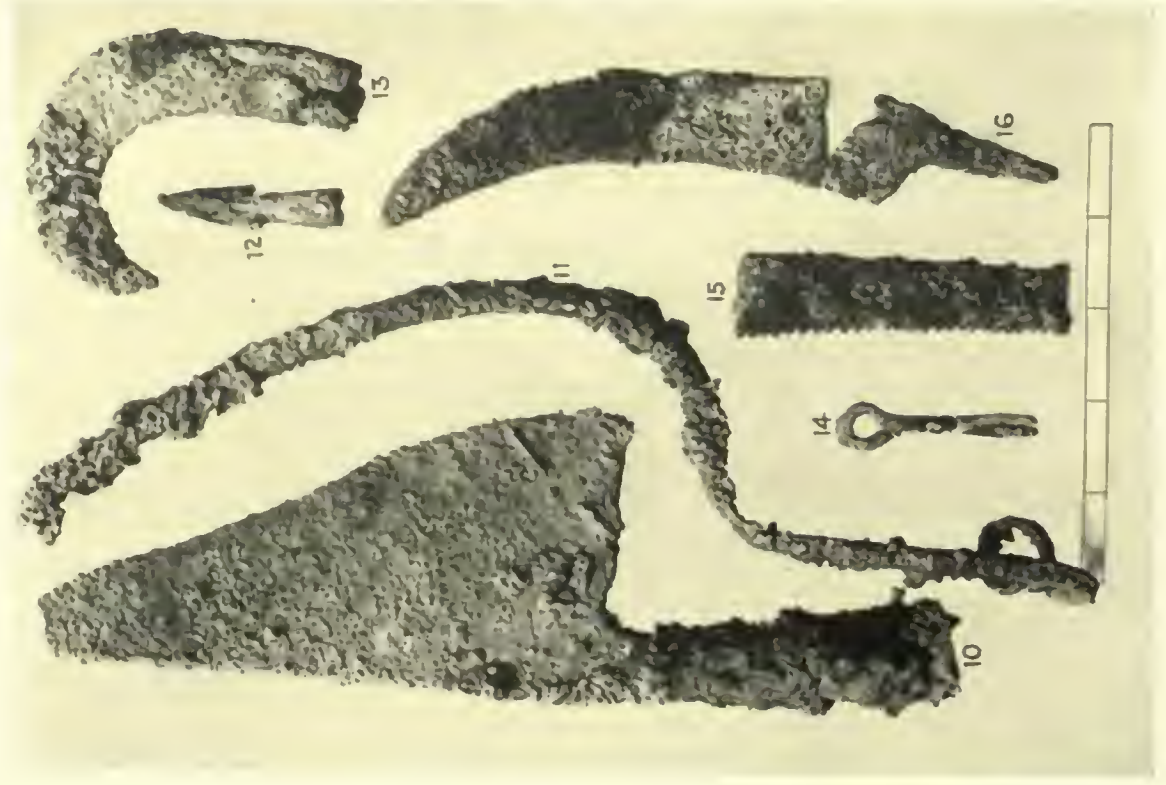
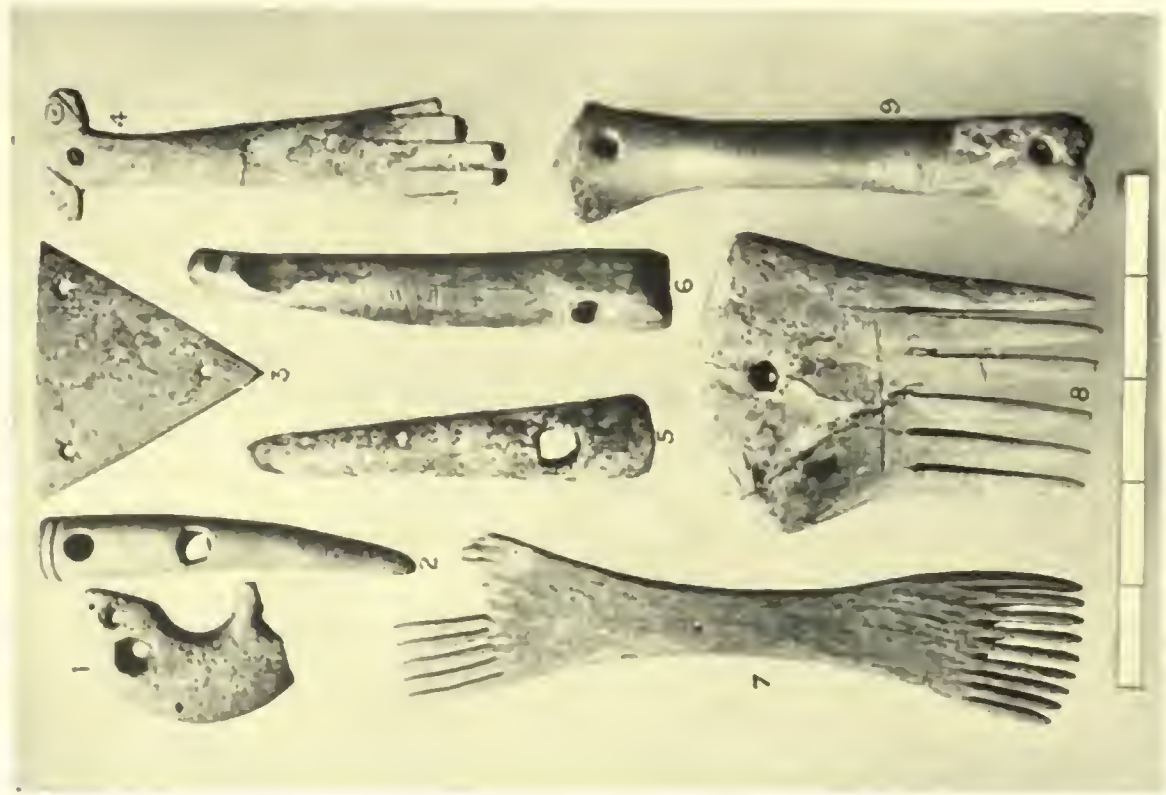
within is part of the wooden handle still pierced by its rivet. The whole is coated by a thin layer of hard stalagmite, which has kept it practically free from rust. Both this and the preceding implement were found in the deep fissure shown on the west side of fig. 4. An implement of quite different form and purpose is illustrated (pl. LXXVIII, fig. 13), obviously a small sickle for cutting off the ears of corn, as in Eastern countries at the present day. It is $3\frac{1}{2}$ in. in length and was found in the Celtic level c. As in nearly all our implements of that age, the socket is folded over and is open at the top, still showing its rivet and traces of a wooden handle. A small knife, shaped exactly like a solid razor, came from the Celtic layer d and is $2\frac{1}{4}$ in. in length.

Tools for working in wood and bone were used by the Celtic people, who attained a considerable degree of proficiency. Of the saws, one very well preserved specimen (pl. LXXVIII, fig. 15) from level f is $3\frac{1}{2}$ in. in length, and has the teeth set in the fashion of the present day, but it will be observed that they slope the reverse way to the taper of the tool, proving that, as with oriental saws, the cut was made towards the operator. We find no trace of handle or mounting. Another has exceedingly fine teeth, too fine for setting, but its precise date could not be fixed. Of gouges we have two well-finished specimens from the upper Celtic level c, one $3\frac{1}{2}$ in. long being shaped for making a rounded cut, while the other is for making a V-shaped cut. Somewhat related to these, though for a different purpose, is a heavy double-edged chisel, evidently for cutting holes in stone, $3\frac{1}{4}$ in. long, with a cutting edge $1\frac{1}{8}$ in. wide, corresponding with the socket holes in a fine pair of beehive querns from the cave.

Among the other objects of iron is a split pin (pl. LXXVIII, fig. 14) which was doubtless used as a linch-pin for a wheel of some kind. It is one of those objects which, coming from a slope of detritus, cannot be accurately dated.

Awls and Drills. Specimens of various forms range from the crudest of bone tools to a very fine iron drill, such as compares favourably with similar articles of the present day. A handle of antler with the stump of an iron awl came from the lower Roman level n. There were six instances of socketed drills or awls, two having still a portion of the wooden handle intact: they occurred from levels d-g. An implement made from the tibia of a goat, and perhaps used in weaving, has at its lower end a perfectly round hole and its point cut off obliquely to straighten the bone. A stout bone awl and other objects of the same material, but of uncertain use, also came from the Celtic levels.

Two objects of special interest throw definite light on the habits of these Cave-dwellers. One (pl. LXXIX, fig. 16) is the hoof-plate of an ox from level n, and it will be observed that the form of the nail-holes is identical with that of modern horseshoes. Hoof-bones of *Bos longifrons*, repeatedly met with, indicate a hoof of just this size. Another is of thinner metal, with round holes, and is from the upper level. Two implements consisting of a straight shaft 3 in. long with one end turned at right angles, and flattened out into a disc, are probably keys of padlocks. Portion of a handle through which a rivet passes into a piece of iron rim, from level c, probably belonged to a bucket which may have been of wood carved from the solid. Another of somewhat similar form came from the fissure opening on the west of fig. 4. It is $10\frac{1}{2}$ in. round its arc, and has a neat hook at one end, the other being broken off. It is $\frac{3}{8}$ in. wide at its broadest, tapering at either end to half that width. One of our oldest finds is apparently a tethering ring with a large looped spike



BONE AND IRON OBJECTS FROM WOOCKEY HOLE

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or staple which ran loose upon it. It has had its staple driven through a post and clinched, and came from level G, in which it was one of the lowest finds. A portion of a second similar ring and spike was found near by. A latch-key of the usual British type (pl. LXXVIII, fig. 11) is 12 in. long and $\frac{3}{4}$ in. wide at the handle, which is looped and had a loose ring for suspension. It accompanied the similarly encrusted chopping-knife (pl. LXXVIII, fig. 10) and the bill-hook. From its similarity to the latch-lifter or key of the Glastonbury lake-village and other sites, we suggest that it served to open a bolted door in the palisade. An object believed to be the shoe of a wooden spade or shovel came from the upper level A. Such shovels have been found from time to time in the process of working the débris at the Priddy lead-works, three miles away on the top of Mendip, and one was found in the cave itself. An object of unknown use is of thin iron in the form of a diamond, mounted upon a circular and much more massive piece which served as a handle or support. It is from a slope of detritus, and of doubtful age. A looped spike $5\frac{1}{2}$ in. long, and a small handle of iron, probably for a cauldron, came from level F. An object of familiar form, 2 in. in length, consists of a toothed wheel, set after the fashion of a spur, the pointed handle having a series of engraved lines giving it at first sight the appearance of a screw. This was from the Roman level near the door of the cave, and was probably a tool for milling a pattern on pottery, several of the Celtic specimens bearing just such a pattern as would be made by this tool (figs. 12, no. 7 and 13, no. 5). A lump of imperfectly smelted iron measures 3 by 2 by $1\frac{1}{2}$ in. and was found in level B; a smaller piece came from level F. Among the other objects of iron should be mentioned the nails, which prove that there was great diversity in the wooden articles made in the cave. The majority of the nails are from the Celtic layers, especially E and F. As the same types occur all the way through the excavations, having been probably picked up and used over and over again, we have not thought it necessary to give their respective levels. Other small objects of iron from the Roman levels include a small buckle; a portion of a twisted wire link, possibly part of a balance; and the point of a hook-shaped blade, apparently a curved knife or sickle. Two penannular brooches (fig. 6), quite perfect, are from the bottom of the Roman deposit.

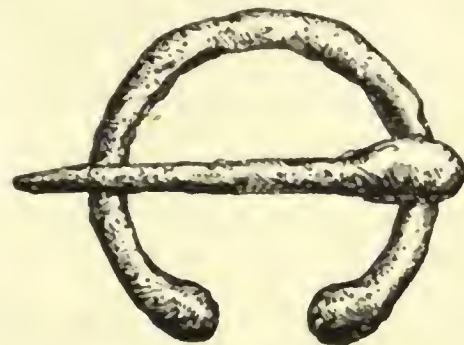


Fig. 6. Iron penannular brooch. $\frac{1}{4}$.

Bronze. It is perhaps remarkable that specimens of bronze are rare in the Celtic layers. We have only seven articles which certainly came from them, though others occurring in the detritus slopes and in pits among boulders may be of pre-Roman age. A group of eight leaves of bronze, very much corroded, from the bottom of a deep pit, shown in fig. 4, on the eastern side of the passage, formed an ornament of which each leaf was fastened to the next by a bronze rivet, and may have been pinned through on to some support beneath. A rivet, $\frac{1}{4}$ in. in length, still remains fixed in one of them. The thirteen S-shaped links of a chain nearly 6 in. long, from the bottom of level D, vary much in size and degree of bending, whilst two terminal links are of brighter metal and show some slight decoration. A ring $\frac{7}{8}$ in. in diameter, apparently a ring brooch with the pin missing, is from level C: it is roughly triangular in section, the back being flat. Another brooch, $1\frac{3}{16}$ in.

long (fig. 7), is referred to the transition between La Tène II and III, which is rarely represented in this country. In this case, as in that figured in the British Museum *Iron Age Guide* (fig. 82), the collar has become merely ornamental, the foot having been brought up to the lower part of the bow, and the enclosed space containing none of the ornament which characterizes the later forms. This was found associated with a broken currency-bar and Celtic pottery close to the stalagmite floor, which occurred slightly beyond the section shown in fig. 4 near the western wall of the passage. Portions of two twisted bracelets are from level c; and a solid bronze dagger-mount, with its accompanying blade, has been already referred to (p. 575).



Fig. 7. Bronze brooch. 1.

A delicate silver ear-ring, $\frac{3}{4}$ in. across, thickened at the base and flattened on one side, was associated with part of a crushed skull, probably of a young woman, and came from level d. One of our rare silver coins also came from the Celtic deposit, where the stratification was most marked. This is a denarius of Marcia, B. C. 124, in good preservation, the inscription being clearly legible. Its occurrence at so high a level suggests that the great deposit lying beneath it may go back for much more than the few hundred years commonly assigned to the late Celtic period.

Among Romano-British bronze, from the upper levels A and B, are a finger-ring of bronze from level A, having a lozenge pattern separated by dividing bars; and a bronze ear-ring with overlapping points and almost rectangular in section from a scree under the east wall, where the ages are mingled.

A round bronze brooch $1\frac{1}{8}$ in. in diameter, from level B, is of thin repoussé bronze, mounted on a more substantial piece of the same metal, the broken pin being hinged.

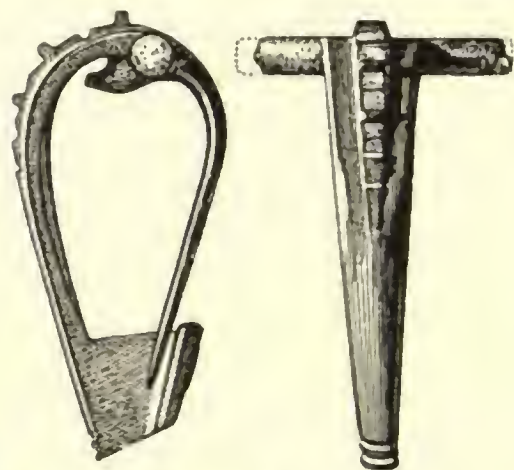


Fig. 8. Roman bronze brooch. 1.

The raised figure is probably a stag, surrounded by a bold pattern resembling a series of minute discs, strung on a cord. A fine brooch (fig. 8) $2\frac{1}{4}$ in. in length is from level B, but found in such a position that it may possibly be of earlier date. Its head is T-shaped, containing only the iron pin on a hinge. The bow has a toothed ridge towards the head, and transverse lines towards the foot, which is solid and without decoration. A penannular brooch of $1\frac{3}{8}$ in. diameter was found with Roman pottery at the bottom of 'Hell Ladder'. When found it had knobs of corroded bronze raised upon the ring. Three hinges came from the Romano-British deposit, and a repoussé disc was found in the boulder chamber to the east of the main passage; it may have formed part of a brooch. A button of cup-like form, with

turned-over edge, is of Roman age, as well as portions of a bronze purse from level B, which was very much crushed when found. A tore-like hook accompanied it, together with a third brass of Constantine.

Three channelled bands must have formed the edge of, and been riveted to, some spherical vessel of which there was no trace: it was probably of wood. A pair of tweezers



BONE PINS, SPINDLE-WHORLS AND HOOF-PLATE, WOOKEY HOLE. 1

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is just over $\frac{3}{8}$ in. wide and $2\frac{3}{4}$ in. long. This and the bands are thought to be of Roman¹ age, although they did not occur in definite stratification, but in material complicated by boulders. A stout pin with decorated head bears some resemblance to one of the bone pins (pl. LXXIX, fig. 8). Two others are of an undetermined white metal, one having a much corroded bronze head. Another, of excellent workmanship, had, when found, a faceted head like pl. LXXIX, figs. 6, 7. Several bronze pins of varying length, some headless, came from the upper Roman level A; but one of a different type (fig. 9), nearly 4 in. in length, with its head flattened and looped over, came from the lower Roman level B. It may originally have had a ring attached to the head.

Glass. The Celtic deposit yielded only one specimen, a broken bead of typical Celtic form, with decoration resembling the human eye, the three colours being blue, white, and brown.

Of Roman glass, specimens were more numerous, both ornamented and plain green bottle. A piece of green glass showing sand markings has one edge worked like a neolithic flint.

Pins, needles, &c. Specimens of bone were found throughout the levels. The greatest depth at which they occurred was level E, where we obtained a pretty little needle (pl. LXXIX, fig. 11). It is $1\frac{3}{4}$ in. in length and has a large eye, not drilled, but cut out with some pointed implement. From level D came part of a larger needle and bone pins, one having been broken and re-pointed. From the next higher Celtic layer C we have two of the best needles obtained, $2\frac{7}{8}$ in. and 4 in. long. The broadened head shown in pl. LXXIX, fig. 11, has disappeared, and the eye is a longitudinal slot (pl. LXXIX, fig. 10). Figs. 1-8 of pl. LXXIX are pins from the top Celtic layer C and the Romano-British layer B, showing heads of widely varying forms, from flat to rounded and conical.

In the Roman levels we obtained a very good series of pins and needles. One needle, a broken specimen, is perfectly round in section, with fine notches on one side, possibly to improve the grip; and a well-made needle or bodkin measures $5\frac{3}{8}$ in. in length, with a wide head. This and several others are made from the fibula of the goat, some of which bones we have found partly prepared for the purpose. Pins from the lower Roman level B include perhaps the finest in the collection, with much originality in the form of the head. Figs. 6 and 7 of pl. LXXIX are specimens with perfect faceted heads, whilst fig. 2 is the largest of all, nearly 4 in. in length. Specimens of the usual type are figured, several being re-sharpened specimens. One specimen (pl. LXXIX, fig. 8) bears evidence that the saw was sometimes used to shape the bone. As articles for fastening clothing are scanty in the cave—buttons being very rare and only occurring in the highest level, whilst brooches also are uncommon—we conclude that these pins were used for the purpose and were not worn in the hair. The Celtic skeleton already mentioned from Priddy, though intact in every particular, had the tresses of hair plaited and tied at the ends without any trace of pins, though decorative beads were present with the body.



Fig. 9. Bronze pin. †.

¹ Similar bands occur among definite Roman remains at Gough's Cavern, Cheddar.

A point worthy of note is that the Roman element here caused no change whatever in the form or use of the pins. Iron needles, mostly with the eye-portion missing, came from the lower Roman level B.

Tin and Lead. Articles of these metals are scarce, but enough occur to show that trading took place with Cornwall. An ingot of mixed metal contains by weight, according to Mr. Jas. Ricketts of Wells, who has kindly analysed it: Tin 33·84, lead 38·46, impurities and loss 27·69. It was found quite at the bottom of level E, and is therefore of considerable age. It presents a much fractured surface as if due to rapid cooling. One end appears as if it had been cut off obliquely. Another lump of alloy of the same metals, obviously the result of pouring from a crucible, was found in the boulder chamber. This lump has been analysed by Mr. G. E. Webb and proved to be composed of tin 16·5, lead 70, impurities 13·5. Of lead the only two examples are spindle-whorls, convex on one side, with a diameter of $1\frac{1}{8}$ in. and therefore precisely similar to one from Thor's Cave in Derbyshire.¹ They are from the Celtic level C, as was also a little crucible of clay, $1\frac{1}{2}$ in. in diameter, which would have held just enough metal to cast a spindle-whorl. It appears, however, to be unused.

Spindle-whorls. Other spindle-whorls of various forms occurred almost throughout the excavations. One of the oldest objects we have, from the lowest level of the excavation, is an antler-burr whorl, $2\frac{1}{4}$ in. in diameter, with the outer edge rounded off (pl. LXXIX, fig. 17). Its spin is somewhat eccentric through faulty piercing: it was associated with two other whorls and a massive pounder made of antler. Of the latter whorls, one was $2\frac{1}{4}$ in. in diameter and little more than $\frac{1}{4}$ in. thick, with a very small hole, whilst the other (pl. LXXIX, fig. 15) is a heavy whorl made from the cave conglomerate, somewhat concavo-convex in form, showing marked striations on both sides and periphery, whilst its hole is countersunk from each side in a manner suggesting that it may have been used as the head of a bow drill. In this it resembles a whorl-like object recorded by Evans, *Ancient Stone Implements*, 2nd ed., p. 439. A femur-head adapted for spinning purposes is also from level C, and this form was evidently copied in one of unbaked clay from E, which has the advantage in weight. The clay whorl, however, appears never to have been completely pierced. Level F has yielded crude whorls of lias and clay, both baked and unbaked; D gave us more perfect forms in these materials (pl. LXXIX, fig. 14), and a double-convex specimen, turned from Kimmeridge shale, may be either a whorl or bead (pl. LXXIX, fig. 13). Level C also yielded well-made whorls in pottery roughly chipped to shape. Two whorls are of lead, and several whorl-like discs were unperforated, while the upper levels A and B yielded finely finished specimens. One, almost conical, is decorated with seven rings, two of which are on the edge (pl. LXXIX, fig. 12). The other side is slightly convex and has four concentric circles upon it. The pierced hole tapers slightly, and the material is a nearly black stone, apparently slate. Another is similarly turned, but is of baked clay and has its under surface slightly concave. It is decorated with black lines, eight on the upper and three on the under side, and in this case again the hole is tapered.

Pebbles and shale. Of what may be considered gaming-stones from levels A, B, and C, six are common seashore flint pebbles, another a white quartzite pebble probably from

¹ Evans, *Stone Implements*, 2nd ed., 438.

the Old Red Sandstone Conglomerate, also a large Cave-pearl, such as still occur in the great chambers beyond. Among objects of flint may be mentioned a curved knife $2\frac{1}{2}$ in. long, found in B, the lower Roman level. A scraper-like piece from level F was possibly a strike-a-light, and portions of one large ball of flint came from level D.

Of Kimmeridge shale, a lathe-turned whorl (pl. LXXIX, fig. 12) has been mentioned above, and there were two fragments from level D of a large turned cup $\frac{3}{8}$ in. in thickness and $6\frac{3}{4}$ in. in diameter, at the level of the larger portion. In connexion with these, we may draw attention to two bone bands which have iron rivets and must have been used for some such vessel as this.

Querns. Conglomerate from the Old Red Sandstone of Pen Hill or of North Hill was chosen for querns, a hard and durable material, with a coarse cutting grain, and numberless white quartzite pebbles to assist attrition. With crude tools of iron the manipulation of the stone must have cost infinite labour. A pair of beehive quern-stones were found together in the position shown in section (fig. 2). They belong to level E, at which period they were placed at the entrance to a cavity, the subsequent levels accumulating over them. The top stone is 13 in. across at the base, and $3\frac{3}{4}$ in. thick measured through the centre hole; this is worn to a slight oval by contact with the spindle, which was fixed in the nether stone. The top stone was manipulated by one side-handle only, the socket for which was cut with an iron chisel. The nether stone is much more massive, and has been left in a less finished condition on all but the grinding surface. The central socket hole is $1\frac{3}{4}$ in. deep and the same in diameter.

The upper stone of a similar quern, made from the same material, but somewhat flattened at the top, has two handle holes, one of which has a portion broken away. This stone measures 13 in. across the base and is $3\frac{3}{4}$ in. thick through the centre hole. It was embedded in a slope of wood ash, containing nothing but Celtic pottery, down the small passage on the east side just within the door of the cave. A saddle-quern came from level D, and mealing-stones were found in close proximity. All are made of the same bed of Old Red Sandstone, not the conglomerate bed.

Lamp. The only lamp found was in such a position that it was impossible to determine its precise level. It lay amongst detritus under the east wall, 20 ft. from the doorway, and is of oolite, the only article of this material found. It is roughly rectangular in form, and the cavity is $3\frac{1}{2}$ in. square and $1\frac{3}{4}$ in. deep, leaving the sides $\frac{3}{4}$ in. thick. On two places inside the cavity of the lamp are accumulations of lampblack where the wick rested against the side. A very similar lamp is figured in Evans's *Stone Implements*, 2nd ed., fig. 368, from Ty Mawr, Holyhead.

Bone and antler. Some of the most important finds are of bone and antler. There were five types of combs, and no duplicates of any have so far been found in the cave. A long, decorated comb of antler of Celtic origin is similar to a number found in the Glastonbury lake-village, the pattern consisting of crossed lines with a series of intersecting semi-circles at the toothed end. The four fragments were found separately, and after the teeth were broken it appears to have been rounded off at this end for some other purpose. The next comb (pl. LXXVIII, fig. 4), of similar origin and material, is $4\frac{1}{2}$ in. in length, and shaped like the human hand, with lines to indicate the knuckles. Of special interest is the unusual form of the decorated handle, which is T-shaped. Pl. LXXVIII, fig. 8 shows a form of comb

hitherto unknown from this part of Britain. It is a massive comb formed of antler and measuring 4 in. by 3 in. The portion restored was lost through crushing between two large stones and was irrecoverable. Combs of this type occur more frequently in Scotland, and one very similar is figured in the *Cat. Nat. Mus. of Antiq. of Scotland*, 1892, p. 242. A double-ended comb of antler (pl. LXXVIII, fig. 7) 6½ in. in length has six teeth missing at one end. It has a small perforation near the centre, and is undecorated: as a weaving comb it is of unusually light make. Another of very different type is of thin bone, 1½ in. across. The teeth are sawn with a fine saw, and the usual bars on either side (one now missing) were attached by means of iron rivets. The bar is decorated with concentric circles arranged close together. The type is illustrated on p. 232 of the catalogue just mentioned. One object of bone (fig. 10) is of singular interest. It is of Celtic age and was carved from a leg bone, the inside being worn perfectly smooth. The pointed end is spoon-shaped, and is polished to perfect smoothness. The other end is cut off square, and half the circumference of the bone has been removed to a depth of nearly ¾ in. The whole outside surface, except half an inch at the point, is decorated with ring-and-dot pattern in groups, generally



Fig. 10. Ornamented bone of unknown use. †.

of seven separated by lines. Of the same period are two bands of bone ¼ in. wide, tapered at the ends, which overlap and are secured by iron rivets, one of them intact. The method of obtaining such bands is a problem, as they are solid, and show no trace of internal tissue. Their purpose was doubtless to secure some vessel which was liable to split, and it is noteworthy that fragments of such a bowl or cup of Kimmeridge shale occur from the same level. Also of Celtic origin is a perfectly equilateral triangle of thin bone (pl. LXXVIII, fig. 3), each side being 2½ in. in length. It will be observed that half an inch from each angle a hole is pierced through the bone, and surrounding each are star-like radiating grooves. We found by experiment that if threads are passed through each hole of the triangle and attached to a spindle with a whorl fixed, the result is a three-ply cord; and when so used, the threads fall invariably into one or other of the groovings surrounding the perforations.

An antler pick 4 in. long is broken off at the squared hole, which shows the method of fixing the handle. A partially squared hole was made in the latter, the antler was forced into it, and a square peg (probably of wood) was driven through at right angles. Around this rivet hole are evident signs of wear, as if the pick-head had worn loose by constant use. A great brow-tine 10½ in. long was probably prepared for similar use. Four implements which

commonly go under the name of cheek-pieces (pl. LXXVIII, figs. 2, 5, 6) are supposed to have been used as part of the mouth-piece of pony-bridles in Celtic times. They are of highly polished antler, sometimes decorated with lines. One (pl. LXXVIII, fig. 6) shows near its point two deep groovings due to extensive wear. Another is pierced at the end to the depth of an inch. Many similar cheek-pieces have been found in the excavations of the Glastonbury lake-village. We have already indicated that the Celtic inhabitants of the cave knew the art of lathe-turning, and we illustrate half a bearing, in bone, of what was doubtless such a machine (pl. LXXVIII, fig. 1). It was a flat ring, of which the circumference was cut through to allow the spindle to drop in. Countersunk holes, with finer supplementary drilled ones, provided a means for fixing the bearing against some structure for support. The central or shaft hole shows very marked wear. A small piece of antler is highly polished on the outer side by long use as a kind of slick-stone or burnisher; and a bone knife with quite a good edge was made from a split ox-bone. Roe-deer antlers, sawn off and worked up, appear to have been used as awls or borers, or possibly as implements for shaping or lining pottery. Part of a large antler of red-deer from level G, of which the tines have been sawn off, shows the difficulty experienced in severing so hard a substance with crude iron saws. It was detached obliquely from the beam to obtain an edge, which appears to have been used for some time for pounding. The sawn surfaces show a degree of polish due to long handling. Portion of a rib with a series of evidently intentional cuts made with a fine knife-edge was probably a tally-stick; and bones (pl. LXXVIII, fig. 9), pierced to adapt them to some unknown purpose, also occurred. One is pierced no less than six times, one hole being re-bored to obtain greater accuracy. At the end removed from the holes a notch was sawn, evidently to guide the course of a cord; and the wear of another suggests that it was used to draw tight a cord which passed over it. Another implement $3\frac{1}{4}$ in. in length, and $1\frac{1}{2}$ in. in circumference, is the proximal end of a metatarsal bone, probably of goat. It is pierced in the centre of the end with a squared hole, and obliquely from back to front with a round hole with marks of attrition, showing that it had been much used for guiding a cord which had passed through it at tension, wearing the top of the hole on one side and the bottom on the other. A similar bone $3\frac{1}{2}$ in. long is pierced at the end and at one side only with an oval hole, whilst a shorter specimen 2 in. long is pierced only at the end. These are all from level D. The metatarsal of a red deer, from the same level, $6\frac{1}{2}$ in. long, with the distal end missing and with an exceedingly high polish, was evidently used for a long period as a burnisher. A portion of rib from level C, 4 in. in length, has the broad end cut into five teeth, resembling the teeth of a saw, one-sixteenth of an inch from point to point. This is unquestionably a potter's tool for making the waved pattern seen on a number of fragments, especially the fine ewer shown in fig. 12, no. 1. This and a burnishing tool of deer-rib 7 in. long render it probable that much of the pottery found in the cave was made on the spot. The only specimen of worked bird-bone is a portion of a crane's ulna, 4 in. in length, which has a round hole half an inch from the end, and, more doubtfully, in the end also; perhaps for use in weaving.

Human Remains. Dean Buckland appears to have found human remains across the river in the first great chamber, and also probably in the eastern upper gallery, near its bifurcation. There is little doubt that both were interments, and some twenty years ago we still found traces of human bones in both these places. At the former spot, human

teeth, finger and toe bones, with other fragments, exist at a level just out of reach of the highest floods, in a passage reached by climbing over the sandbank which is visible on the left as you look down stream. This little passage ascends very steeply, and we know nothing of its higher parts. With the bones, and mingled with the gravel and mud on the floor, are fragments of pottery, too much worn to identify. How men crossed the river to this point for the purpose of burying their dead is not clear. When six feet of water is drained off from the cave there are exposed great boulders with bosses of stalagmite, and with difficulty, and not without some risk, it is possible to pass over to the lower muddy slopes of the sandbank. In days gone by the passage may have been easier, but there is evidence that the water long maintained a level several feet higher than it now reaches with both sluices closed.

As previously stated, we found some time since that an interment had been disturbed, and much of the skeleton removed, a few yards beyond the bifurcation of the eastern upper gallery. Portions of vertebrae, finger joints, and part of a scapula remained, whilst stones and gravel had been thrown back. Within the last year, however, we have proved that fragmentary remains of a similar character may be found almost anywhere in that gallery, on removing any of the stones of the floor. They seem to be unaccompanied by pottery or implements. In the boulder chamber shown on the plan (fig. 1) we have found human remains associated with Romano-British pottery. The distribution of the human remains has been a puzzle to us. There were fragments of every portion of the human skeleton scattered upon the surface where this was occupied by boulders, beyond the area of our diggings. It seems impossible that this can have resulted from any form of burial, as these fragments had been as carelessly handled as the bones of the food-animals. The same applies to the excavated area, except in one case where the possibility of interment comes in. Both embedded in the ordinary floor-material and among the bone refuse we found human bones, which must have been thrown there at the same time. All must have lain mingled upon the surface during the occupation and some exhibit marks of gnawing. Moreover, certain well-preserved pieces of human skull were found embedded in the stratum of ash, and no other fragment of skull in the same condition has appeared, though we have long since passed the locality, and removed every atom of material from wall to wall. Skeletons are represented in our finds by very old individuals of massive build, and little babies with uncut teeth. In at least one case, that of the skeleton found in the fissure on the left of fig. 4, there is evidence that the body lay on the surface above the fissure, and only gravitated into the hole after disintegration. One femur and some of the vertebrae were discovered, not in the fissure but, later, at the bottom of the slope on the other side of the passage. The conclusion is that the individual was the sole occupant of the cave at that time, and died untended, the bones subsequently rolling away in contrary directions. Near the door of the cave, in a little fissure under the east wall, the long bones of another skeleton were discovered, in a situation which pointed to interment and subsequent disturbance by animals; and at the bottom of a slope of detritus near by, a lower jaw and the upper end of a very massive femur lay on the surface.

The few perfect long-bones afford some indication of the stature of the inhabitants. The measurements of the bones of the skeleton found in the fissure are :—

	LENGTH.	LEAST CIRCUMFERENCE.
Femur	16.5 in.	3.25 in.
Tibiae	13.5 in.	2.75 in.
Humerus	11.75 in.	2.5 in.

The measurements of two other humeri are :—

12.25 in.	2.44 in.
11.5 in.	2.37 in.

The stature of these individuals would therefore appear to have been small, varying from 4 ft. 9 in. to 5 ft. 1 in. Unfortunately no perfect skull has occurred throughout the workings; but lower jaws and detached teeth have been found, generally showing marked wear, which is commonly supposed to be due to the use of gritty meal. Both male and female skeletons are represented, as shown by the shape of numerous clavicles, &c. The pair of femora from the fissure and its adjacent slope are markedly pilastered, the outstanding *linea aspera* projecting quite $\frac{1}{4}$ in., whilst the convexity of the bone is most marked. Everything indicates therefore that the occupants of the cave were of the recognized Celtic type, and were accustomed to the squatting posture supposed to be characteristic of the race.

Hone-stones, Hammer-stones, Slick-stones, &c. Of the hones some are made of micaceous schist probably from Cornwall, others of black slate and fine sandstones similar to those used at the present day. Locally the Ebbor grits of the Millstone Grit series, the Old Red Sandstone and the stalagmite of the cave itself were made use of, while the conglomerate of the cavern and the lias of the adjacent hillsides were used for weights. A perforated hammer-stone, pierced from each side irregularly, was broken in use; and a flat piece of fine conglomerate, as well as a naturally pierced piece of grit from Ebbor, probably served as loom-weights. Specimens made of burnt clay occur, but so far in each case broken. In addition to the mealing or hammering, stones were sometimes used for preparing pigment; a grit slab still has attached to it a quantity of fine red material, of which we also found a lump. There were numerous large slabs of this character, of grit, red sandstone, and of lias, all bearing traces of use as rubbing-stones. A very delicate little whetstone, perforated for suspension, is made of imported mica schist, and, with a much-worn hone-stone of very fine material, was found embedded in stalagmite at the north end of the excavations. A hone-stone of grit which has apparently seen little wear is perfectly squared. Among the mortarium stones is a massive and perfectly spherical specimen made from the stalagmite of the cavern itself. Unique among the hones is a fragment of pottery which has been worn deeply on its edge by constant use for sharpening knives.

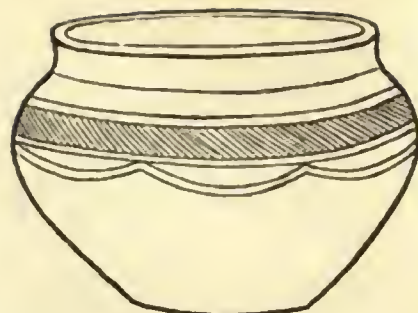
Pottery. It is probable that in the pottery found during our explorations we have representatives of most known types of the late Celtic period. Ignoring the large assemblage of Romano-British specimens, which comprises an equally wide range of form and pattern, we illustrate in figs. 11, 12, and 13 a considerable variety of late Celtic designs. They comprise utensils apparently intended for all sorts of domestic purposes: some were found with burnt food still adhering, and bearing traces of fire; others were perforated after baking at the base with two, three, or four holes, $\frac{1}{4}$ in. in diameter, and were probably used as strainers. A decorated urn (fig. 12, no. 5) has been restored from large portions; others, found complete adjacent to the 'goat's stable', were most likely milking-pots, whilst the larger vessels were most probably storage urns. Fig. 12, no. 1 is a water ewer of



1



2



3



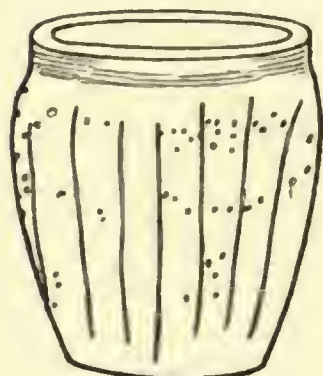
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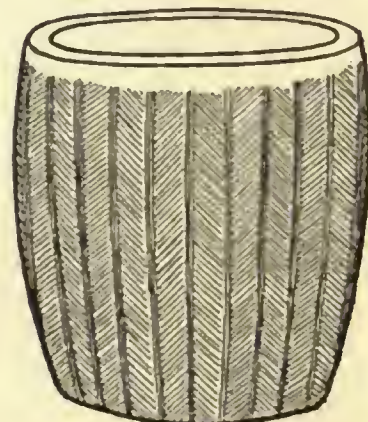
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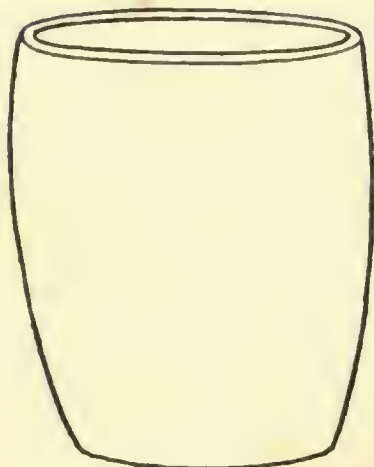
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8



9



10



11



12

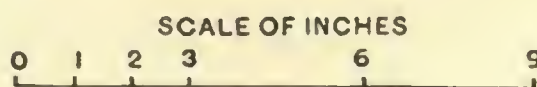


Fig. 11. Pottery from Wookey-Hole.



Fig. 12. Pottery from Wookey-Hole.

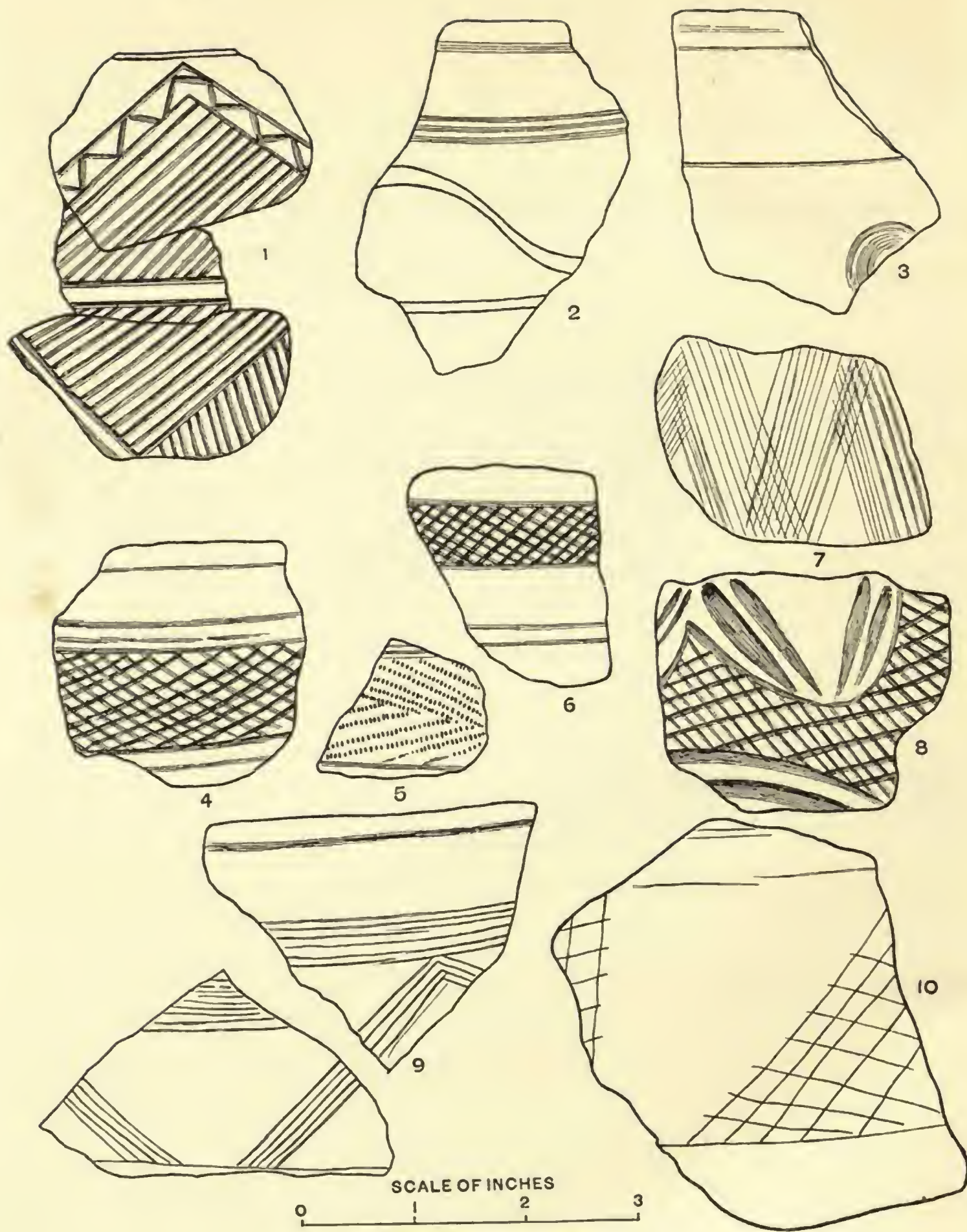


Fig. 13. Pottery fragments from Wookey-Hole.

elegant design, the decoration of which was impressed with a tool which is amongst our finds and with which we have carried out identical decoration on soft clay; the upper half, including the decoration, is in one piece. No. 9 is a small water-bottle, the only one of the type discovered so far, made for suspension by a cord handle. No. 6 is certainly a drinking-cup, of which we have another specimen, with the pattern at the top: in each case the base is decorated with a six-rayed star. No. 7 of the same figure and no. 5 of fig. 13 are of interest from the fact that the decoration has been impressed with a toothed wheel after the fashion of a milling tool, and in the former case accidentally carried too far, leaving an imprint on the neck. Fig. 12, no. 8 is a cordoned vessel, a type not common in the cave. Fig. 13, no. 2, and fig. 11, no. 2 are instances of scroll decoration practically identical with specimens from Glastonbury lake-village. Fig. 11, no. 4 is of fine black ware of a form allied to an urn with longer pedestal, from Shoebury in Essex, now in the British Museum. No. 7 of the same figure is ornamented irregularly with a series of stabs, the groupings of which, we are convinced, are not the result of chance. Some fragments of the vessel are still missing, but those found already show that certain arrangements of the dots are repeated. It is crudely hand-moulded, and probably early in date, being found in a deep fissure among the boulders 85 ft. from the doorway on the western side (marked x on fig. 1). Fig. 11, no. 9 is a vessel of similar form, and is the most heavily decorated of any yet found. No. 8 of the same figure is one of the largest urns; and to show how these things were scattered after breaking up, it should be stated that portions of this vessel were found nearly 50 ft. apart, but fitting perfectly together.

Specimens of a large number of decorated fragments are included in fig. 13; amongst them the elaborate triangle pattern of fig. 1, the finger-impress pattern of fig. 3, the bold decoration of fig. 8, and the lightly scratched lattice-work of fig. 10, are noticeable. Amongst the plain fragments are portions of huge moulded vessels of crude workmanship, one nearly 1 in. in thickness, and over 2 ft. in diameter at the mouth. In the manufacture of these, clay was used with a free admixture of grit and stones, of which some were upwards of 1 in. across. A vessel of this type, but much smaller, was commonly used for boiling, and many fragments bear traces of soot outside.

Wood. Wood decays very rapidly in the cave, but in some very dry parts certain articles were fairly well preserved. In each case this appears to have been due to a deposit of goat's dung in what we have named 'the goat's stable'. Several feet of this substance had accumulated in a dry corner, and finding its way into surrounding cavities, had enveloped these objects and in some way preserved them. They consist of two bowls of wood, apparently oak, which has become as light as cork and very fragile, a spade or shovel blade, portions of a lathe and spindle, and a double wedge. One of the wooden bowls was 7 in. in diameter, with a shaped and flattened base. It had first been trimmed with a knife, and then turned on the lathe, which did not efface all the knife marks. It is 2 in. in depth and little more than $\frac{1}{4}$ in. in average thickness. A very similar bowl, with a plain, flattened base, has the lathe marks almost obliterated by wear. Both were found 12 ft. beneath the floor, immediately adjacent to 'the goat's stable'. From the same place we have a wooden spade or shovel measuring $10\frac{1}{2}$ in. by $8\frac{1}{2}$ in. with an average thickness of $\frac{3}{4}$ in. It is curved in section, with a rounded edge which was never shod, and the handle is broken away. The back shows marked striations from wear, and the front

still retains the cut marks of the adze or curved knife with which it was made. A piece of wood with parallel sides, with the ends shaped on an inward curve and rudely symmetrical, has in the centre of the longer side half a socket hole, suggesting that it received a rotating spindle; and we think it was probably the support of a pole lathe. A curious double wedge of wood measures $2\frac{1}{2}$ in. in length and $\frac{5}{8}$ in. in thickness, and was accompanied by a larger blunt wedge. A wooden shaft in two portions was possibly used in spinning, though it would be too large for any spindle-whorl yet found in the cave.

Leather. Deep amongst boulders near 'Hell Ladder' portions of boot-like sandals were found. There is nothing to indicate their age, but the form is that of a wide, square, toe-piece with a narrow foot and heel. Certain portions also from the deep levels are pierced with large peg-holes, but much of the leather from this source is too far decayed for either its use or shape to be determined.

Grain and Seeds. Among the fire-ash, and in the refuse on the floor of 'the goat's stable', a number of charred seeds occurred, some being selected for further examination. These were submitted to Mr. Clement Reid of the Geological Survey, who identified acorns, beans, peas, and wheat. In addition to these, smaller seeds have been observed, and also portions of bracken root, which may have been an article of food.¹ In some burned food-stuff, probably bread, grains of imperfectly ground wheat were observed.

Animal Remains. Bones were abundant throughout the excavation, being in practically every instance broken to obtain the marrow, and sometimes gnawed by the domestic dogs. The principal food-animal was *Bos longifrons*; then, in about equal proportions, *Sus scrofa* and *Capra hircus*. A list of the animal remains found is appended, but more may subsequently be added:—

DOMESTIC ANIMALS.

Bos longifrons (Celtic shorthorn)
Canis familiaris (dog)
Capra hircus (goat)
Equus caballus (horse)
Ovis aries (sheep)
Sus scrofa (pig)

WILD ANIMALS.

Arvicola amphibius (vole)
Canis lupus? (wolf)
Canis vulpes (fox)
Cervus capreolus (roe-deer)
Cervus elaphus (red-deer)
Erinaceus europæus (hedgehog)
Felis catus ferus (wild cat)
Lepus? *timidus* (hare)
Meles taxus (badger)
Rhinolophus sp. (bat)
Sus scrofa ferus (wild boar)

Remains of birds have been submitted to Mr. E. T. Newton, F.R.S., who has kindly named them as follows:—

DOMESTIC BIRDS.

Fowl
 Large Goose (? domestic)

WILD BIRDS.

Grey Goose	Crane
Barnacle Goose	Capercaillie
Duck (Mallard?)	Blackbird?
Rook or Crow	Pigeon (Rock-Dove or Domestic)
Jackdaw	
Kestrel	

¹ Evans, *Stone Implements*, 2nd ed., 250.

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Molluscs. These have occurred sparsely scattered through the workings, and include the following genera: Cardium, Helix, Mytilus, Ostrea, Patella, Pecten, Sepia. Such shells were used in the manufacture of some classes of pottery found in the lower deposits, and may in the first place have been brought from the coast as food. We noted a similar occurrence not long since in a little cave at Ebbor, associated with neolithic remains.

Roman Coins. These may be taken as affording some indication of the rate of accumulation of the débris on the floor of the cave. The period which they cover will be seen by the following list, and if we exclude the denarius of Marcia, which belongs to a period before the Roman occupation, we find a period of 320 years represented. During this lengthy time the depth of the débris increased only by six inches. When it is borne in mind that the coin of Marcia occurred as nearly as possible three inches below the Roman level, and indicated the deposits of nearly two more centuries, the rate of increase is seen to be regular, if the coin was some time in circulation.

The identification of the following coins has been confirmed by the British Museum authorities:—

NAME AND MINT IF KNOWN.	SILVER.	FIRST BRASS.	SECOND BRASS.	THIRD BRASS.
Marcia (B.C. 124)	1			
Vespasian }		1		
Titus }				
Trajan (Colonial)		1		
Hadrian		2		
Antoninus Pius		1		
Gallienus	1			1
Gallienus }				1
Salonina }				1
Victorinus				
Carausius			1	
Constantius (Lugdunum)			1	1
Constantinopolis (Lugdunum)				2
Crispus (Rome)				1
Constantine II				1
Magnentius { Rome Treviri British }			3	
Constantine II (Siscia)				4
Valentinian I { Aquileia Siscia Thessalonica Arles Rome }				20

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NAME AND MINT IF KNOWN.	SILVER.	FIRST BRASS.	SECOND BRASS.	THIRD BRASS.
Valens { Aquileia Arles Rome }				13
Gratian { Aquileia Arles Lugdunum Siscia }				15
Valentinian II (Lugdunum)				3
Indecipherable		2		4
Scrupulus (one British imitation)				
Totals	2	7	5	67

XXVII.—*Lake-dwellings in Holderness, Yorks., discovered by THOS. BOYNTON, Esq., F.S.A., 1880-1. BY REGINALD A. SMITH, Esq., F.S.A.*

Read 15th June, 1911.

THE Holderness district is a vast accumulation of the great Northern Drift, a thick deposit of clay and gravel, with scratched and striated boulders of Scandinavian and other rocks marked by the grinding and drifting of glaciers and icebergs. This Northern Drift rested on the ancient surface of the chalk when that surface sloped from the Wolds, 600 ft. high, to 60 ft. and more below the sea-level. The vast bay that formerly extended from Flamborough Head to Spurn Point thus received the ice-sheets of the Glacial period, which in melting deposited débris frozen into their mass. There was thus formed an irregular crescentic area, 40 miles long and 20 miles in maximum breadth, reaching the foot of the Wolds which was then the seashore with creeks running inland. The tract rarely rises more than 30 ft. above the sea; and the natural drainage, on account of the slope of the drift, is from the seashore towards the centre line of the drift area. The surface drainage from the Wolds also tends to the same line of outflow. In ancient times the outlets of this drainage into the sea would have been higher, as the strata rise seaward; and consequently more water would have been penned up in the prehistoric lakes, and a larger proportion of the area flooded, than would now be possible, since the waste of land by the sea, at the rate of nearly two yards a year, has been going on for many centuries.¹

Until comparatively recently the lower parts of Holderness were covered by inland lakes connected with one another, and ramifying in every direction. The creation of an extensive drainage system has run off the water, and marsh and bog have given place to a most productive soil. An example of these old fresh-water lakes remains in Hornsea Mere, about one mile from the shore. It is about $1\frac{1}{2}$ miles in length, and its deeper parts are below the sea-level, but there are not improbably crannogs in it, islands adapted for habitation. Another lake at Skipsea originally extended to a point now covered by the sea, and was an important fishing property in the thirteenth century.² At present it can be traced in the cliff-section as a hollow in the surrounding glacial clay. It is characterized

¹ From an article in the *Standard*, 20 October, 1883; Clement Reid, *Geology of Holderness*, cap. 1.

² Inquisition at Waghen, 1288: Poulson, *History and Antiquities of Holderness*, pt. ii, p. 445.

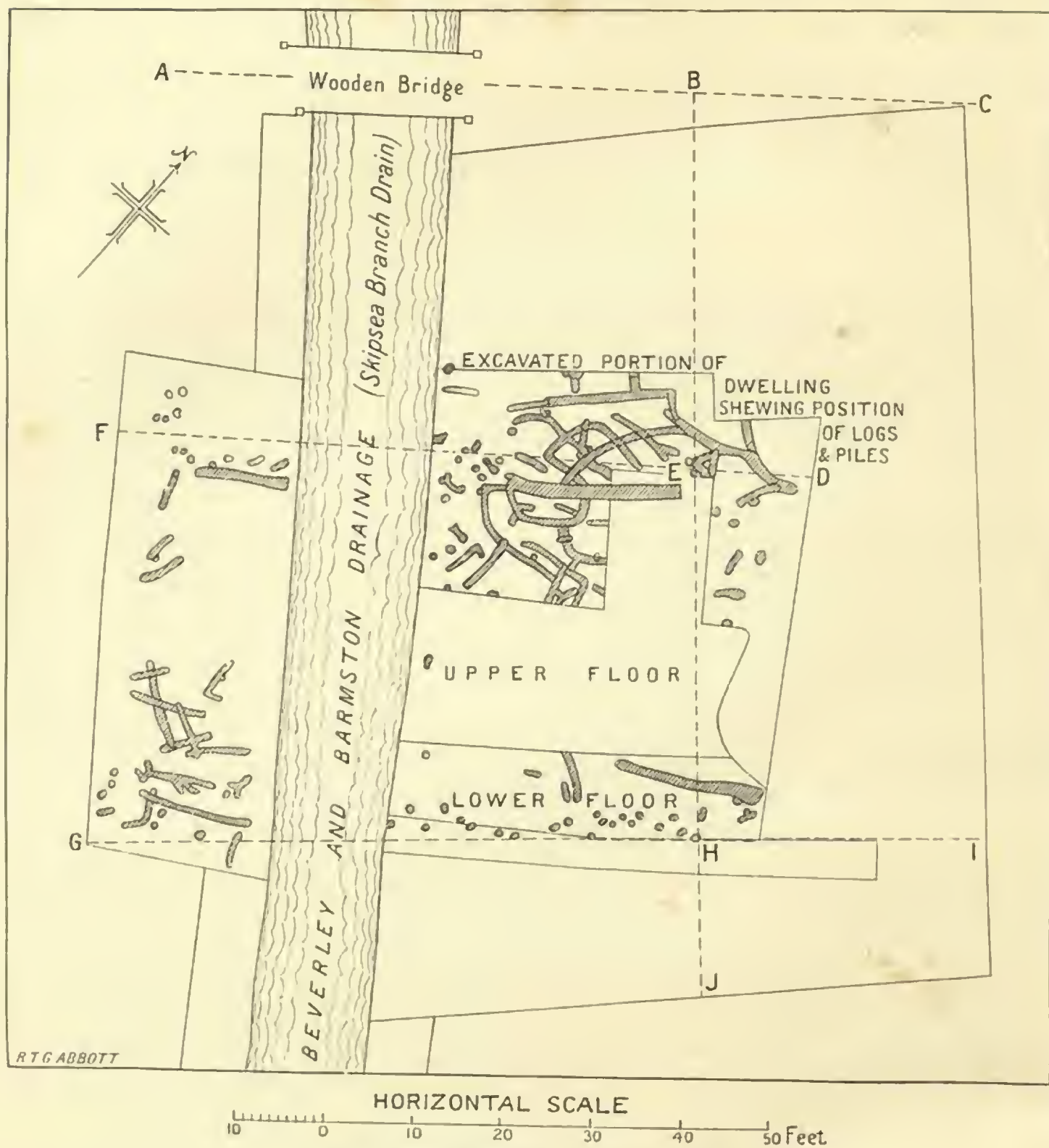


Fig. 1. Ulrome Lake-dwelling. Plan of West Furze.

by thick beds of peat which fill up the hollow, and are in places purely carbonaceous, proving that the influx of water with earthy matter in solution was of comparatively rare occurrence.¹ The former lacustrine condition of this area is further shown by the repeated occurrence of the terms 'carr' and 'mere'; and a parallel has been drawn with the present Broads of Norfolk, though Hornsea Mere, a broad sheet of water $1\frac{1}{2}$ miles long, is to-day the only remnant of the Holderness lakes.

The discovery of ancient habitations in this network of lakes was due in the first instance to the observation of Mr. Boynton, F.S.A., who followed up the clue

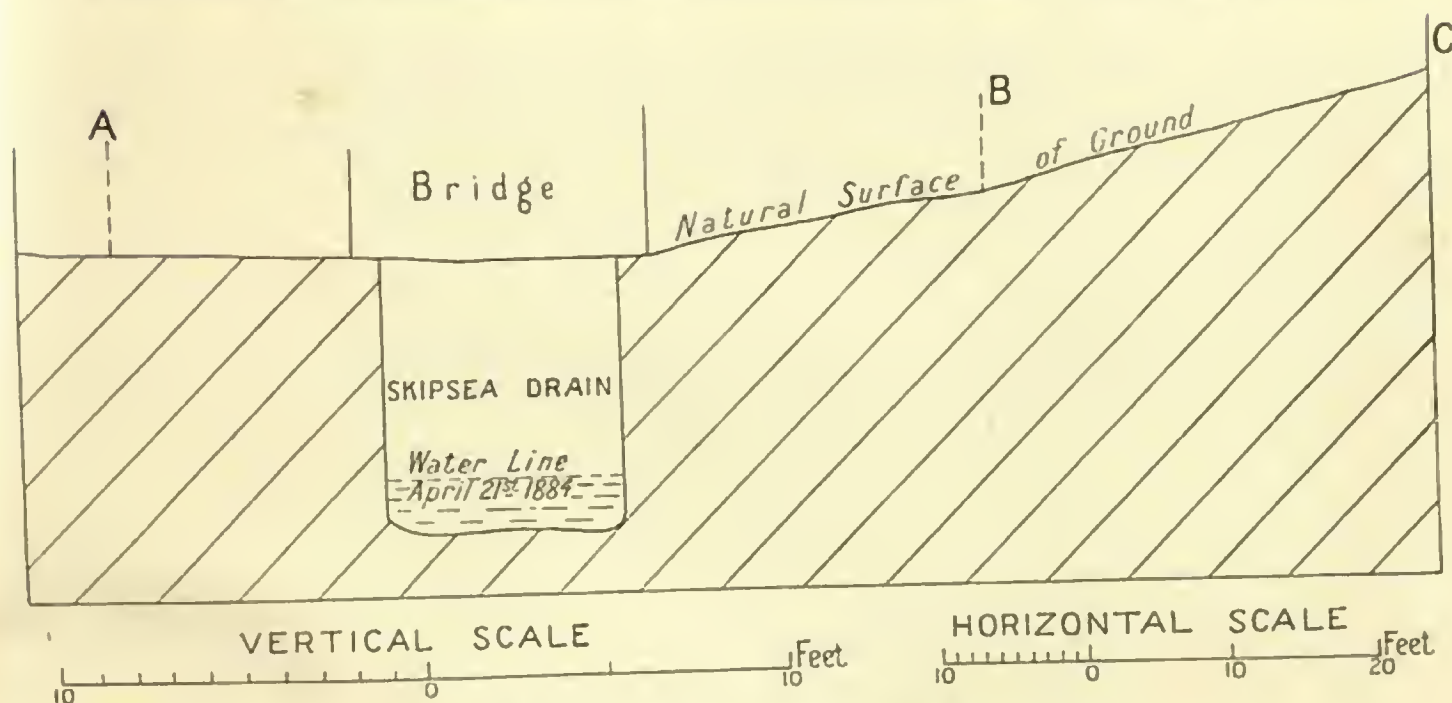


Fig. 2 Ulrome Lake-dwelling. Section A-C.

with praiseworthy thoroughness and eminent success. One of the main drains of this region, which date from about 1800, flows from Skipsea north-west to join the Barmston main drain, about one mile north-west of Ulrome; and about three-quarters of a mile due west of that village, in a field called West Furze, the discovery was made. For about eight hundred yards south of the junction with Barmston drain the original water channel was comparatively narrow, and when the Skipsea drain was being cleaned and deepened in 1880, Mr. Boynton, one of the Drainage Commissioners, noticed a number of oak piles and bone implements that had been thrown out on the bank by the workmen. Subsequently a systematic exploration of the site was undertaken, and resulted in the excavation

¹ These notes are from the *Yorkshire Post*, 26 July, 1883.

of two ancient lake-dwellings, or rather platforms for huts, one above the other, and evidently of different dates (figs. 1-5, and pl. LXXX).

It will be convenient first to describe the various strata in the order of discovery, from the surface down to the original gravel-bottom, and then to reconstruct the platforms ideally, and so gain some insight into the sequence of events on this particular site. An excavation was made first on one bank of the drain, and then on the other, and the original cutting of the drain was found to have been made through the structure. Below the surface soil a considerable thickness of peat was discovered; and at a depth of about 3 ft. the workmen came upon a level surface of brushwood and bark forming an excellent platform. Beneath this were large trunks of trees with their branches laid horizontally, and arranged more or less in accordance with the square outline of the platform. The trees

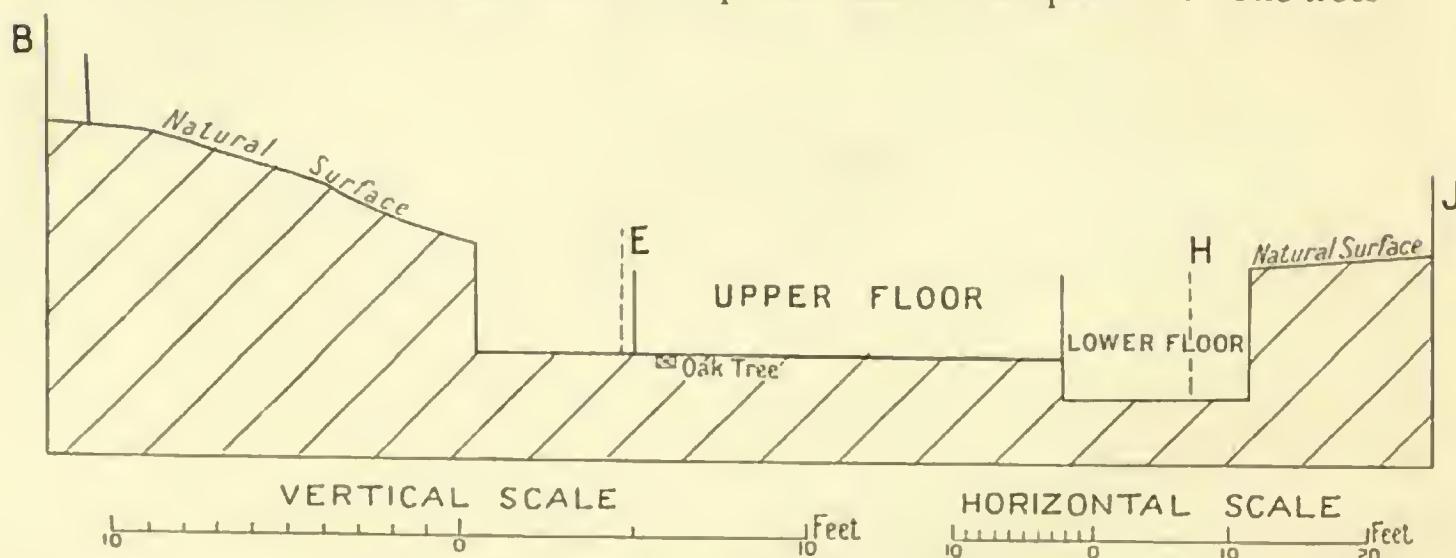


Fig. 3. Ulrome Lake-dwelling. Section B-J.

consisted of oak, willow, birch, ash, hazel, and alder, some of the trunks being 15 or 18 in. in diameter, and as many feet in length. All had evidently been cut down, but not squared. Here and there in the upper structure stood upright small piles or stakes, principally of oak, and 3 or 4 in. in diameter, which had been driven in between the tree-trunks to fix and hold them together; whilst some of those at the outer edges, especially on the north, were placed in a sloping position like buttresses, to give greater security to the structure. There were two straight rows of blunt-pointed stakes on the north side of the timber dam, and a single row on the south side, facing up-stream. The trees had been laid upon a deeper layer of brushwood which rested on the peaty bed of the lake, 2 ft. more of peat intervening before the original gravelly bottom was reached.¹

¹ T. M. Evans, 'The Ancient Britons and the Lake-dwelling at Ulrome in Holderness' (*Hull Quarterly and East Riding Portfolio*, 1885); supplemented by the *Standard*, 20 October, 1883.

The whole area of the structure was exposed, and its dimensions found to be 50 ft. north and south by 72 ft. east and west across stream, the gravel bed

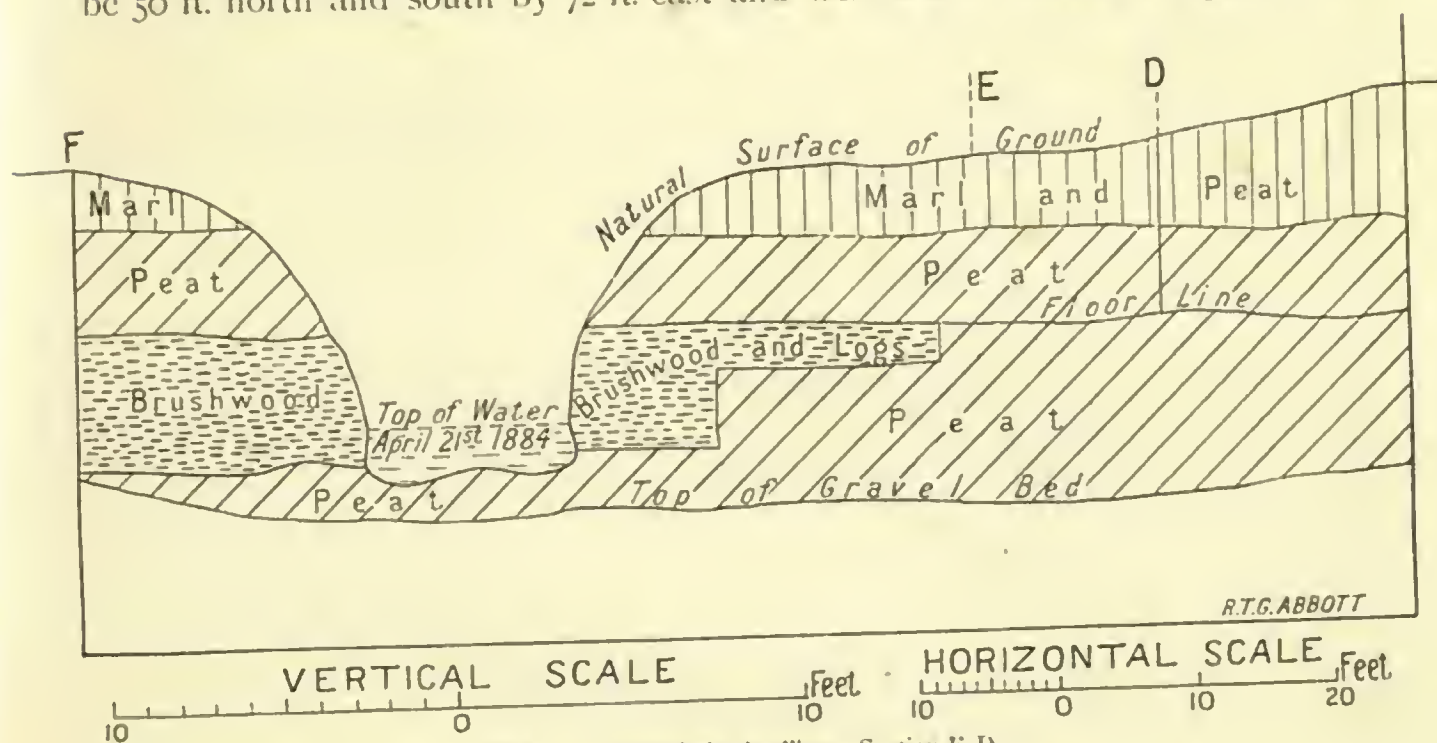


Fig. 4. Ulrome Lake-dwelling. Section F-D.

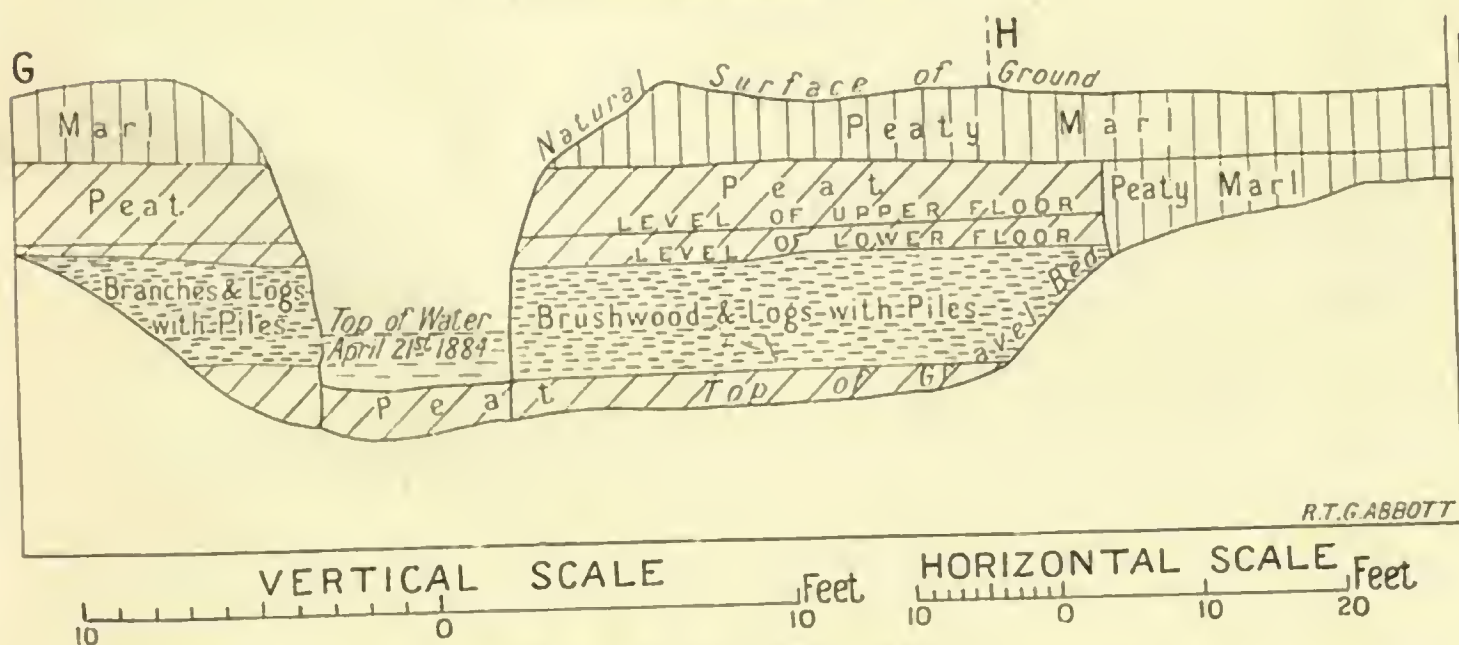


Fig. 5. Ulrome Lake-dwelling. Section G-I.

being about 9 ft. below the surface level. In historical sequence, the various stages have been described by Mr. Boynton¹ as follows:—‘A structure was

¹ Quoted in the *Yorkshire Post*, 26 July, 1883.

erected on the edge of the lake with rising ground east and west. The bed of the lake was composed of sandy gravel, above which about 2 ft. of peat had been deposited. On this the builders placed first brushwood, and then, at a later date, tree-trunks, which crossed each other horizontally, and for the most part without any definite arrangement. They were fastened in position by pointed piles, and the interstices were filled in with broken wood and twigs to the depth of a foot or more until a level surface was obtained, and the whole was then strewn with sand. On this solid surface there was placed an additional thickness of about 18 in. of broken twigs and bark, and on this foundation, which probably reached a little above the water level, were erected the dwellings of the builders. Since the demolition of the buildings there had accumulated about 3 ft. of peat and peaty marl; and above this was more than a foot of warp and surface soil.'

One side of the platform, furnished with extra piling, appears to have reached the land at either end, thus connecting it with both shores of the narrow waters. The strengthening of this side consisted of sharpened upright piles in two rows 5 ft. apart; two of these, higher than the others, and placed opposite one another, may have served as a wicket or narrow entrance at the south-east corner of the platform, which was about 18 in. lower. The wicket was situated at the extreme eastern point of the excavated area (fig. 1) and there was communication with the land on the south-east side. The excavation made for a distance of 12-15 yd. along this side brought to light flints and other stones, some pottery, and human skulls. Of the last named, two passed into the possession of Canon Greenwell; and a third, found with the teeth within the main structure, near its south-west angle, will pass into the national collection with the rest of Mr. Boynton's gift. It is stated by Dr. Keith, Curator of the Museum of the Royal College of Surgeons, to be of the River-bed type, as found by Huxley¹ in Caithness and elsewhere; and is apparently of the male sex. Our Fellow Dr. Wm. Wright recognizes in it one of the four leading types of Bronze Age skulls as found in barrows on the Wolds.

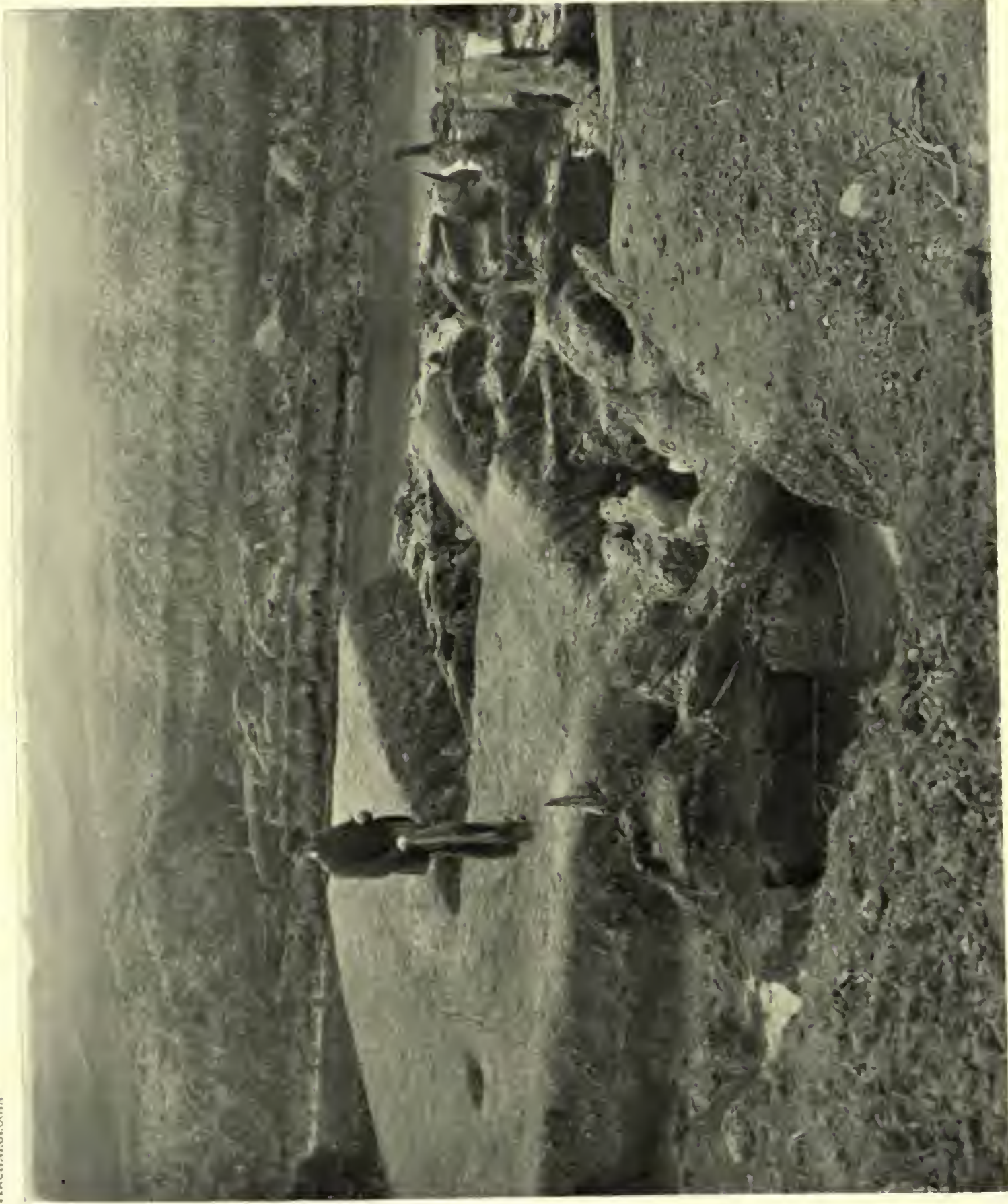
The bone tools thrown out when the drain was cleaned were evidently used as adzes, possibly to cut out the burnt interior of tree-trunks in order to make canoes. They are made from the distal ends of the right and left radius of the ox (fig. 6), the perforations being circular, with diameters between 0.6 and 0.9 in. The present average length is 6½ in., but the smaller end is in all cases more or less damaged. One tool of the same character, 9 in. long, is made of the proximal end of the humerus of an ox, not so well adapted for perforation, and another axe from the articular end of the left scapula of an ox, the length being 5.4 in.

Perforated tools were generally made of red-deer antler, and the adzes

¹ Laing and Huxley, *Prehistoric Remains of Caithness*; *Archæologia*, lx. 313, with refs.

Drain

Drain



WEST FURZE PILE-DWELLING PARTLY EXCAVATED, FROM THE NORTH-EAST

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typical of this site appear to be exceptional. Dr. Corner has a specimen found in the Thames at Hammersmith practically identical with the largest from Ulrome, with the cancellous portion hollowed out evidently for the insertion of a stone celt. Some of the Ulrome bones seem to have been used for this purpose, but others may have had a cutting-edge produced by a sloping cut. Several are much rubbed and polished by constant use. Another parallel seems to be a



Fig. 6. Bone adze-heads, West Furze Lake-dwelling. Nearly $\frac{1}{2}$ in.

group of six in the Museum of Antiquities at Edinburgh (*Cat.*, p. 244, HA. 36), from Skerrabrae, Skail, Orkney.

The flints found with the bone tools are rough lumps, not shaped for any definite purpose, averaging 5 in. by 4 in., and mostly of deep black quality with white crust. Many of the edges are battered, but there is no proof of use as hammer-stones. The other stones consist of grit and quartzite pebbles from the glacial drift,¹ used in various ways, and ranging from 3 in. to 5½ in. in length: some

¹ One lump shows two series of striations.

are bruised at the end by use as hammers, and one is pitted on one face, apparently by use as an anvil-stone for the flaking of flint nodules.¹ A rubbing-stone for reducing grain to meal has one flat face 12 in. by 7 in.: the material is igneous rock.

The pottery urn (fig. 7) now restored is a plain but interesting vessel, curving in at the lip, and made without the wheel.



Fig. 7. Urn of plain brown ware, West Furze Lake-dwelling. $\frac{1}{2}$.

It measures 7.7 in. in height, and has a maximum diameter of 12 $\frac{1}{2}$ in., the diameter inside the lip being 10 $\frac{3}{4}$ in. The ware is light brown with a reddish core, the rather soft paste being sparsely mixed with large grit, and the surface pitted by some substance (not grain) that has been burnt out in firing.

There were reasons for supposing that the structure was not all of the same date, and the position of the earlier or lower platform could be determined with some precision. In the photograph (pl. LXXX) Mr. Boynton may be seen standing on the upper platform; and that there was a considerable interval of time between

them is shown in an interesting way by the manner in which the piles were prepared. At the beginning of the excavation a number of piles were dug out of the bottom of the drain where they had been originally driven into the lake-bed, and it was noticed that they had been sharpened in a very primitive fashion. The lower end had been trimmed rather than pointed, and evidently with a stone adze, as the concave cuts were comparatively short. In fact the stone tool seems to have been used as a wedge as well as an adze, and it is possible that the extremity of the pile was first reduced by burning.

The upper piles, on the contrary, had been sharply pointed with a metal axe used vertically in the right hand, and from the associated relics it is practically certain that the metal used was bronze. In some instances the sharp points had been driven into the top of the older piles which had decayed, another argument in favour of two dates for the structure. As might be expected from the difficulty of felling and trimming trees with stone axes, the earlier platform was seen to contain less timber than the upper one, which appeared to have extended somewhat beyond the limits of the platform below.

¹ Similar pitted stones from a neolithic workshop floor in Aberdeenshire are exhibited in the pre-historic section of the Glasgow Exhibition this year.

The efficiency of the stone axe was tested in 1878 by the erection of a log-hut in the presence of several Danish archaeologists, the timbers being prepared without the use of metal.¹ The effect of a stone celt on timber has since been discussed and illustrated abroad² as well as in Britain, so that there can be little hesitation in deciding whether a given piece of wood has been worked with a stone or bronze tool. At Ulrome the water had preserved the shape (though not the solidity) of the piles to such an extent that the axe-marks were plainly visible, and the accompanying photograph (fig. 8) shows a specimen brought to a rough point by means of a bronze tool.

Similar tool-marks on piles have been described by Mr. Ludovic Mann,³ who excavated a number of pit-dwellings in Galloway that had floors constructed of closely-set piles. The timbers chiefly employed were birch and alder, and the



Fig. 8. Pile pointed by means of a bronze tool: Ulrome Lake-dwelling.

smoothness of all the cut surfaces showed that the axe had a finely polished surface and a clean, unbroken cutting-edge. The facets were of small area, and resembled the inner side of a flattish spoon. Knots had to be worked round and the harder timber was wedged off, the tool being used to split the wood from the point where the penetration ceased. The axe must have been comparatively blunt, with two convex faces, the line of intersection being a slight curve; and his conclusion is that a neolithic celt was the implement used, though a socketed bronze celt might produce cuts of a similar character. The entire absence of bronze or other metal on this site points to the earlier date, and agrees with the Ulrome evidence.

It was at first thought that the drain marked the limit of the structure on one side, but a trench driven at right angles to the drain brought to light a number

¹ N. F. B. Schested, *Archæologiske Undersøgelser*, 1878-81, 3.

² *Aarb. for Nord. Oldkynd. og Hist.*, 1891, 383; 1898, 125.

³ *Antiquary*, xli, 287, 291, 333. Piles in a pit-dwelling at Stoneykirk, Wigtownshire, are described with illustrations by Mr. Mann in *Proc. Soc. Ant. Scot.*, xxxvii (1902-3), 382.

of interesting relics on the south, the northern side (on the right of pl. LXXX) however proving entirely barren. In the marl, at a depth of 15 in. from the surface, was found part of a Roman mortarium and a rim-fragment of another.¹ Other finds are of the period just preceding the Roman occupation, and consist of a countersunk handle² from the shoulder of a vessel of grey-brown ware, black outside; and part of the foot-rim of a vase, a half-round moulding projecting beyond the base as in many Late-Celtic specimens. There were also the flat base of a vessel 6½ in. across, the ware black outside, and pale brown inside; parts of a large vessel or vessels 0.7 in. thick, with a pinkish brown coating without, the core and inside surface being black; and several lips of vessels, everted and squared, without any mouldings. There were also one piece of rouge and part of a jet ring too small for a bracelet. It is on the average ½ in. wide, and the inside and outside diameters would have been 1.9 in. and 2.5 in. respectively.

On the north side of the same cutting, and just within the pile-dwelling, was found a small heap of chipped flints, evidently the refuse of a workshop on this spot. They are unpatinated, and all appear to be unused except two pieces that have served as end-scrapers or planes. They present a marked contrast to the series found in the pit south-east of the lake-dwelling described below. The most striking feature of their distribution is that the lower part of the structure yielded no pottery, and the upper part no bone implements.³ Hence it may be inferred that the earlier inhabitants were unacquainted with the potter's art, and their successors had abandoned the use of bone implements in favour of metal. The only specimen of metal, however, that came to light was a socketed lance-head of ordinary form, containing fragments of its wooden shaft, and dating from the latter part of the Bronze Age; and it must be concluded either that metal was extremely rare in this locality, and consequently preserved with extreme care, or that the second occupation of the site was of short duration. The lance-head was found at the end of the large oak-tree seen in the middle of pl. LXXX; it was in very fragile condition, but measured when complete about 4½ in. in length, and 1.2 in. across the blade, the wooden peg to fix the shaft in the socket being still in position. The blade is leaf-shaped, the socket tapering and passing down the centre practically to the point (fig. 9).

Three pieces of red-deer antler showed traces of human work. The upper part, including the cup and points and the trez tine, had evidently been sawn

¹ A Roman house with a maze-pattern pavement has been discovered at Harpham, five miles north-west of this site (*Proceedings*, xx. 215).

² Like that figured in *Proceedings*, xxiii. 128.

³ The bone tools were found to the west of the structure in the drain and on the opposite bank before systematic excavation began. One vertebra of an ox was found with traces of a shaft in the orifice and, though showing no signs of use, had evidently been a mace-head.

all round the beam and then snapped off. Another tool, resembling the miner's pick of the neolithic period, consisted of a beam 17½ in. long with the trez tine snapped off, and the bez used as the head; and there was also found a pick-head made of the brow tine with the burr attached.

The animal bones collected have been examined by my colleague, Dr. Andrews, F.R.S., and a selection made for the Natural History Museum. The following were the species represented:—

1. DOG. Portions of two skulls of a terrier type.
Very similar skulls are found at Silchester.
Also lower jaw of a large wolf-like breed.
2. PIG. Teeth and portions of bones.
3. RED-DEER. Numerous portions of antlers, one indicating an animal of large size.
4. SHEEP. Bones of a very small breed, like the Soa-sheep.
5. OX. Numerous portions of jaws, teeth, and limb-bones. Two forms are represented:—
(1) A small shorthorn (*Bos longifrons*) with much compressed horn cores: the bulk of the specimens belong to this type.
(2) A large animal represented by bones which have been employed as axe- or pick-heads, nearly all of which are made from the distal end of the radius of this form. Some individuals were as large as most of the Pleistocene specimens referred to *Bos primigenius*. Possibly the small shorthorn was domesticated, the large species wild.
6. REINDEER. Represented by the lower part of an antler—this specimen is in quite a different condition from the others, and probably is from an older deposit.
7. HORSE. Parts of a skull and a number of bones of a rather small breed. One individual seems to have attained extreme old age.
8. BEAVER. Jaws and limb-bones.
9. CORMORANT (*Phalacrocorax carbo*). Wing-bones.
10. WILD DUCK (*Anas boschas*). Wing-bones.

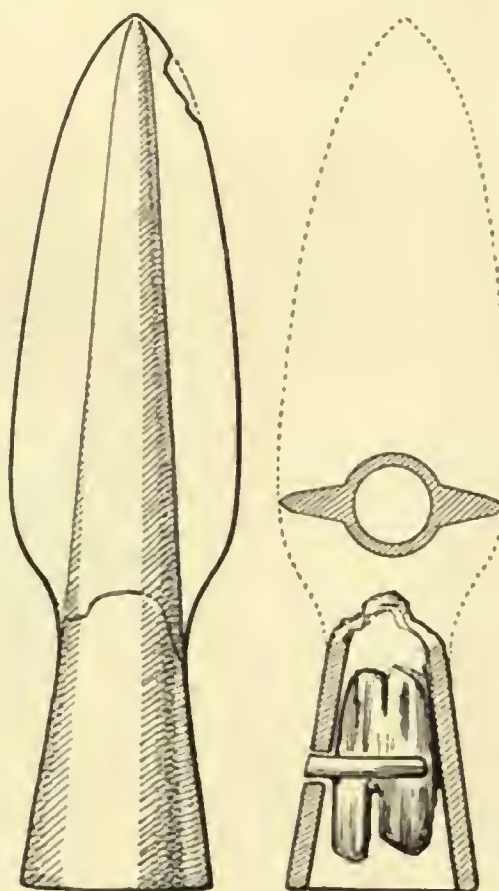


Fig. 9. Bronze spear-head, with wooden peg, West Furze Lake-dwelling. $\frac{1}{2}$ in.

The presence of the reindeer in this part of Britain during neolithic times is questioned by Dr. Andrews, but it may be mentioned that in the peat of Newbury, where pile-dwellings have been found, is thought to have occurred part of a reindeer's antler, dark in colour, and bored through in two places. The

discovery has been brought into question,¹ but is worth consideration in the light of the Ulrome specimen.

About 20 yards south-east of the West Furze lake-dwelling Mr. Boynton came upon an ancient pit which he excavated with interesting results, though it cannot be said to throw any light on the date of the adjoining structure. It was approximately 30 ft. long, and 8 ft. wide at the bottom, but not easily distinguishable from the surrounding soil as it had been gradually filled up with sand and peat. In



Fig. 10. Pottery urn from pit, West Furze. $\frac{1}{2}$.

it was found a human skull with the bones of one hand, and a large urn in pieces, presented to the British Museum by Mr. Boynton in 1904, and now restored (fig. 10). It is of oval form, 26 in. in height, with a high shoulder, and a maximum girth of 6 $\frac{1}{4}$ ft. The lip is curved outwards, and the whole is a remarkable example of potting without the wheel, the ware being black and pitted by some substance that disappeared in firing. A number of flints came to light here showing a considerable variety of patination on both worked and unworked specimens. About half the total showed secondary chipping, and included four cores, blades, scrapers,

¹ *Newbury District Field Club*, 1886-95, 210.

a borer, and one 'burin', closely resembling a graving-tool of the palaeolithic cave-period. At a higher level were found a few pieces of Roman ware—part of the rim of a large grey-ware urn, and part of the rim and bottom of a mortarium, with the characteristic grit added to facilitate trituration. Between fifteen and eighteen inches from the surface were many fragments of typical mediaeval pottery, red ware with yellow or green glaze.

The Round Hill lake-dwelling at Ulrome was discovered on the east bank of the Skipssea drain, about midway between West Furze and Skipssea, and about 5 furlongs north of the junction of the east and west branches of that drain. The site was investigated by Mr. Boynton in 1885, and the construction was found to be inferior to that of the West Furze settlement. The logs were not made to overlap, but thrown in promiscuously, and though some were of large dimensions there was no attempt to render the structure solid by means of piles, except in one case where a pile 4 in. in diameter had been driven into a log twice the

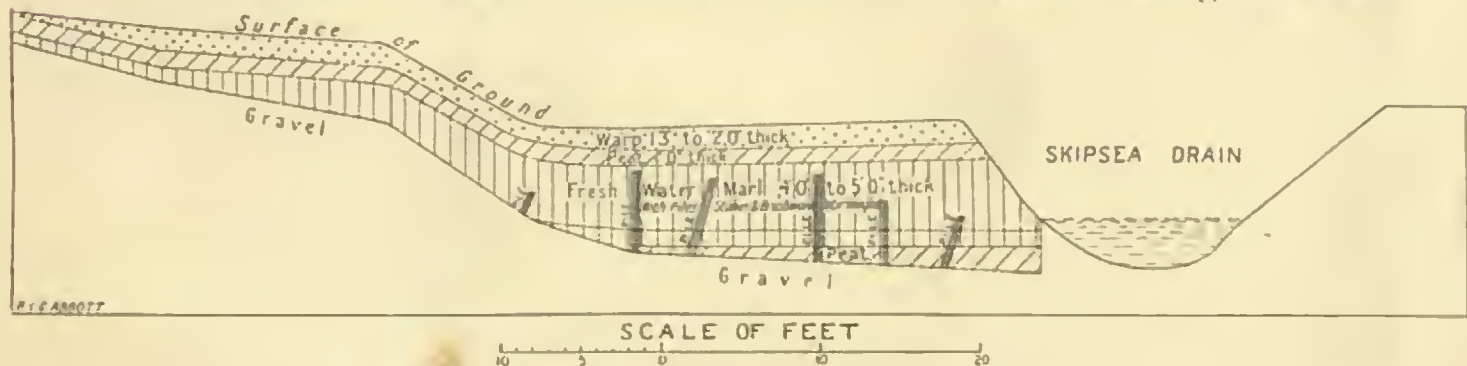


Fig. 11. Ulrome Lake-dwelling. Section of Round Hill.

thickness without splitting it. This indicates that the larger log had been in position long enough to be softened by decomposition before the pile was driven into it. The wood used was in most cases easily identified as oak, ash, elm, willow, sallow, Scots pine, alder, birch, crab, hazel, whin (furze), and thorn. A considerable amount of bark had been beaten in among the sticks to form a compact mass, which was supported on the north and south sides by buttresses. In a trench dug 7 ft.-11 ft. deep on the south side was found a piece of oak $3\frac{1}{2}$ ft. long, 1 ft. broad, and about 1 in. thick, that was completely charred on one side. Near it were several flint flakes and pieces of animal bones, all resting on the original lake bottom. On the north side the trench was 16 ft. deep, and shells of the freshwater mussel were found in some quantity on the bottom. The woodwork and piles reached a depth of $12\frac{1}{2}$ ft. (fig. 11); and near the edge of the structure on this side was found part of a human skull at a depth of 4 ft.

The principal traffic appeared to have been on the south side, and the connexion with the north side must have been merely temporary, as there was no

evidence of a pathway. It was there, however, that part of a jet armlet (fig. 12) was found about 3 ft. below the surface. Much more charred wood was noticed on this site than at West Furze, and in one spot flint flakes were so plentiful that seventy were counted in one spadeful of earth. Certain mosses,¹ too, that grow on trees were also well represented, being possibly used as tinder for striking fire; and it was observed that there were no marks of a stone axe on the logs or piles of this structure. Other finds from this lake-dwelling include a stone celt 3.1 in. long, and 2.4 in. across, with the butt and cutting-edge chipped in use, but otherwise polished all over; and part of a circular mace-head, somewhat roughly shaped, with a diameter of 2.8 in. and depth of 1.6 in., the 'hour-glass' perforation being 0.8-0.9 in. in diameter. There were also rough lumps of flint, some with sharp edges as though used as cores, and an unshaped piece of jet, such as occurs on the Yorkshire coast. Fragments of a vessel about 7 in. high, with a diameter of 9½ in., are

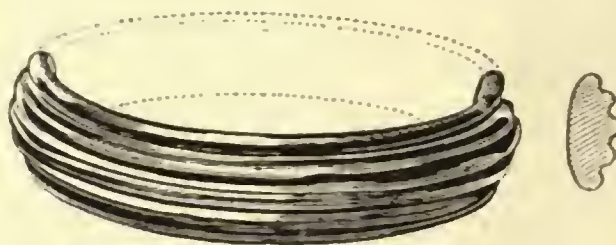


Fig. 12. Jet armlet, Round Hill Lake-dwelling. 5.

of black ware with a greyish yellow facing, the profile being not unlike the larger and perfect urn from West Furze (fig. 7).

Whereas at West Furze the upper platform extended beyond the lower, at the Round Hill the upper layer was of smaller area. Both sites had been abandoned, and nothing of any value left behind; there was no sign of any sudden panic nor of a conflagration, though charcoal was plentiful in both excavations.

In some respects the Round Hill site resembled the upper part of West Furze, and was a good example of the early practice of selecting a spot with sandy soil close to an island or peninsula, or between two of these. The settlement would thus be protected by water or marsh from wild animals, and the adjoining pasture for domestic animals would be surrounded by a palisade. From the nature of the case it is difficult to excavate such sites, but a settlement extending 200-300 yd. can still be traced by the piles visible in the drain at Gransmoor, on either side of the road from Gransmoor to Great Kelk. Here, beside the Barff Hill bridge, was found a Roman vase of grey ware coated with black, 9.6 in. high, with burnished lattice pattern on the body and a lead plug to stop a hole worn in the bottom: another hole is worn in the side.

¹ *Antitrichia curtipendula* (now found near Braemar, Scotland) and *Hypnum cupressiforme* (common in temperate climates) have been identified.



SKETCH-MAP SHOWING POSITION OF LAKE-DWELLINGS IN HOLDERNESSE
(Dotted portion originally under water)

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Other indications of lake-dwellings have been noted near the outfall of the Barnston main drain, about $\frac{1}{4}$ mile from the shore. Here was found a grooved and perforated stone measuring 9.5 in. by 6.9 in. that evidently served as an anchor, and weighs 10 $\frac{1}{2}$ lb. A well-made bluish-grey stone celt, 4.9 in. long, came to light here in 1883: it is of oval section, ground smooth near the cutting-edge, and pointed at the butt. Two years previously the same site produced a bone axe-head made from the distal end of the right tibia of a small Bos, the perforation being 0.5–0.7 in. in diameter through the greatest width of the bone. Part of the rim of a large Roman jar of hard grey wheel-made pottery was also found near the Horse Bridge, but whether this belonged to the lake-dwelling that seems to have existed here cannot be determined. There is also evidence for a lake-dwelling at Brunton Hill, which is near Lowthorpe station, and west of Little Kelk.

The foregoing account of excavations and discoveries has been compiled mainly from information supplied by Mr. Boynton, with whom the writer has lately visited the various sites. The work was undertaken single handed in 1880, with a considerable expenditure of time and money, but in the following year this Society was approached by Canon Greenwell and granted £25 towards further excavation, a like sum being privately contributed by Dr. Freshfield, then Treasurer of the Society. It will be freely acknowledged that it is primarily to Mr. Boynton's enthusiasm and self-sacrifice we owe our knowledge of lake-dwellings in Yorkshire. Apart from more recent exploration at Glastonbury and Meare on sites occupied at a later period than the original habitations at Ulrome, very little has been recorded of such structures in England. Dr. Robert Munro has a short supplementary chapter in his work on *Ancient Scottish Lake-dwellings or Crannogs* (1882), and summarizes the discoveries in Holderness and Wretham Mere (Norfolk),¹ London Wall (City of London), Langorse Lake (near Brecon), and Barton Mere (Bury St. Edmund's). Crannogs or fortified islands are common in Scotland and Ireland,² but seem to belong to the Early Iron Age and later times, while the well-known pile-dwellings of Switzerland, dating in part from the neolithic period, illustrate a different and much higher civilization. There is little literature on English sites of this description,³ for the obvious reason that they are themselves of rare occurrence; and the present paper should be regarded rather as a record, however imperfect, of excavations that were in danger of oblivion, than as a treatment of the whole question. With this end in view, the conclusions are briefly presented with due regard to the dangers and difficulties of the subject, and with all the more diffidence as the writer was not an eye-witness of the exploration. Since Dr. Munro's account of British and foreign

¹ Discoveries of 1856: those of 1851 are described below.

² Col. Wood-Martin, *Lake Dwellings of Ireland*.

³ *Archæologia*, xxxviii. 177.

lake-dwellings was published, some further light has been thrown on the subject, and a few references are given below, though they cannot be said to mark any great advance in the study.

A pile-dwelling at Pickering, beyond the Wolds, and nearly 30 miles north-west of Ulrome, has been described by Mr. J. Spink,¹ and subsequently by Hon. Cecil Duncombe.² In 1893 some coarse pottery was thrown out in clearing a stream, and in the vicinity four rows of piles were found crossing the Costa at a distance of about 100 yds. from each other. These seemed to converge on the centre of a peninsula which was thought to contain lake-dwellings; and at the foot of the piles, under 10 in. of soil, 2½ ft. of stiff blue clay and 6 ft. of peat, were found large quantities of bones and broken pottery, on the original lake bottom of Kimmeridge clay. Various animals were represented, and remains of no less than four human skeletons were found, of a short but muscular race, a woman being not more than 4 ft. 6 in. in stature, and the largest thigh-bone giving a height of not more than 5 ft.

In the neighbourhood of Newbury, Berks., pile-dwellings have been discovered³ that present some points of resemblance to those of Holderness. The peat of the Kennet valley has been largely exploited, and points to swampy or lacustrine conditions in prehistoric times. In 1870 a pyramidal building approached by three causeways at a depth of 15 or 16 ft. was noticed in Fence Wood, near Hermitage, but the inrush of water prevented a close examination. Underground pile-structures, consisting of unbarked oak balks roughly hewn, with cross-beams resting on vertical piles, have been found in Newbury itself. In Bartholomew Street a platform of fir-poles was met with 7 ft. from the surface. Rudely pointed stakes had been driven into the peat, and the articles found included numerous flint implements of neolithic types, as well as animal bones. A circular structure 30 ft. across was also found in digging peat near Cold Ash. The planks were 16–18 ft. long, and roughly hewn, beams crossing from side to side and resting on piles. It was approached by a kind of causeway, and was built on the borders of a morass, which has been a resort of wild fowl within the memory of man, and originally formed part of a much larger sheet of water.

The following account is extracted from a paper⁴ read at Cambridge in 1862 by Alfred Newton, Fellow of Magdalene College:—

A few miles from the town of Thetford the country is characterized by a considerable

¹ *Proc. Yorks. Geol. and Polyt. Soc.*, 1895, 21.

² *Journ. Anthropol. Institute*, N.S., i (1898), 150; and *Assoc. Archit. Soc. Reports*, xxv. 240, where Mr. Thos. Sheppard mentions a lake-dwelling at Crowland (Miller and Skertchley, *The Fenland*, 578).

³ Mr. Boynton classifies this as Roman, and regards the site as of much later occupation than Ulrome.

⁴ *Newbury District Field Club*, 1872–5, 123, 130; 1886–95, 206; *V. C. H. Berks.*, i. 193.

⁵ *On the Zoology of Ancient Europe*, published by the Cambridge Philosophical Society.

number of ponds or meres varying in size from twenty roods to fifty acres. Many of these are situated in the parishes of East and West Wretham, and one of them in the latter parish, known as West Mere, is five or six acres in extent. In 1851 it was drained by the proprietor, Mr. Birch of Wretham Hall, and below the 4 ft. of water which it usually contained, was found soft black mud about 8 ft. deep, during the removal of which a large number of bones were discovered, chiefly at the bottom. They nearly all belonged to the red-deer (*Cervus elaphus*) and the now extinct *Bos longifrons*, but among them were part of a goat's skull with the horn cores and the skull of a boar or pig. Near the centre of the mere, below the black mud, was found a ring or circular bank of fine white earth, as firm as average sea-sand when damp; and outside the ring the bottom was so soft and deep as to be almost impassable until the mud was cleared away. The ring was 20 or 30 ft. in diameter, a foot wide (evidently at the top), and about 4 ft. high; and not far from its inner face was a circular hole, about $4\frac{1}{2}$ ft. in diameter, and some six feet deeper than the bottom of the mere, having the appearance of a well, and containing mud even softer than that outside the ring. This cavity was marked out by a circle of stout stakes or small piles, apparently of alder, which bore traces of having been wattled. It was not in the centre of the ring, and between the two circles were the remains of a wall composed of flints packed together with marl or soft chalk. In the same place was some earth of a bright blue colour, which crumbled to powder on drying. In the intervening space a still greater number of bones were found as before, and also the remains of a rude ladder, which could be identified as such, but so decayed as to be incapable of removal as a whole. Its sides were about 15 in. apart, and the rungs about the same distance from one another.

The stakes appeared to have been split from trees some 4 in. in diameter, and were very hard, as heavy as stone and of a dark grey colour. The fragments of the ladder, on the contrary, were very rotten and light, but the remains of both soon perished on exposure to the air. All the skulls of *Bos longifrons*, with the exception of one unusually large specimen, showed a fracture in the forehead; and of the deer-antlers some had been shed and others sawn from the skull. The large bones had been fractured at one or both ends, but not split longitudinally. No traces of metal were found during the excavation, but a large number of flint discs were recovered that were considered sling-stones, but not illustrated or described in detail.

The largest of these Thetford meres, about 48 acres in extent, was drained in 1856, and the results described by Sir Charles Bunbury,¹ who noticed nothing of archaeological interest except numerous posts of oak, shaped and pointed by man, standing erect below the mud.

Points both of contrast and comparison are afforded by a recent discovery in Sweden.² Between Lake Wetter and Lake Tåker, near the south end of the Oenberg, at a place called Alvastra, pile-dwellings have been excavated in soil

¹ *Quarterly Journal of the Geological Society*, xii. 355, where the Wretham discovery is also briefly recorded: see *Archæologia*, xxxviii. 187. The piles are here said to have been found standing erect at a depth of 20 ft. from the surface, in peat below a deposit of peaty mud.

² *Fornvännen*, 1910, 29.

that was in prehistoric times nothing but a swamp, but is now drained and habitable. The paved floors lay under a deposit of peat, and the settlement was of considerable extent, but the part laid bare sufficed to prove that it dated from the gallery-grave (our long-barrow) period, that is, from the close of the neolithic age, and (according to Prof. Montelius) approximately from 2500 to 2000 B.C. The animal remains were of swine, cattle, sheep or goat, red- and roe-deer, marten, badger, dog, and bear. As at Ulrome, hazel-nuts had evidently been collected for food, and a stone with a hollow in one face strongly resembles that from West Furze regarded as an anvil, though this explanation is not suggested in the Swedish account. Tinder was also found as at Ulrome for use with flint and pyrites, but the pottery was ornamented in a style known from other discoveries to date from neolithic times, and to belong to the East Swedish culture, as opposed to the agricultural civilization of southern Scandinavia (Scania and Denmark). The latter group of the neolithic population had domesticated animals, whereas the people of eastern Sweden were only in the hunting and fishing stage; and it is noteworthy that pile-dwellings have not been found in south Sweden or Denmark.

This settlement in Sweden has been examined with the thoroughness and knowledge characteristic of Scandinavian archaeology, and certainly suggests a neolithic date for the first occupation at least of the West Furze site in Yorkshire. Polished stone celts were found at Round Hill and Barmston, and quantities of flint flakes and lumps more or less battered at West Furze, but these alone would scarcely be conclusive evidence of date. The occurrence of a pitted stone (probably an anvil for flint-working) in neolithic surroundings in Sweden, however, adds considerably to the chronological value of the Ulrome stone finds, and the occurrence of a bronze lance-head in the upper level points in the same direction. It is unfortunate that no neolithic or Bronze Age pottery recognizable as such came to light at Ulrome, as this material is excellent evidence of date; and the evidence of the stones is somewhat invalidated by the repeated occurrence of plain ware that is almost certainly of the Early Iron Age, though the absence of ornament makes identification somewhat hazardous. The Roman finds may indicate an occupation in the early centuries of the Christian era, but the mediaeval pottery does not involve a re-occupation at a time when some of the Irish crannogs were still in use. The thick deposit of peat above the dwellings here and in Sweden proves an early abandonment of the sites.

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